Studio Command™

User Manual

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Declaration of Conformity

according to ISO/IEC Guide 22 and EN45104

Manufacturer's name:	High End Systems, Inc.
Manufacturer's address:	2105 Gracy Farms Lane Austin, Texas 78758 USA
Distributor's name:	High End Systems, Inc.
Distributor's address:	2105 Gracy Farms Lane Austin, Texas 78758 USA

Declares that the product

Product Name:	Studio Command
Product Number:	All
Product Options:	All

conforms to the following EEC directives:

73/23/EEC, as amended by 93/68/EEC

89/336/EEC, as amended by 92/31/EEC and 93/68/EEC

Equipment referred to in this declaration of conformity was first manufactured in compliance with the following standards in 2005:

Safety: EN 60598-1 : 1997
EN 60598-2-17 ; 1990
A1-A3 : 1998
A13: 1999

EMC:

EN 55022		
	Conducted Emissions	Class A
	Radiated Emissions	Class A
ANSI C63.4		Class A
FCC 47 CFR Part 15		Class A
VCCI V-1/2001.04		Class A
EN 55024		
	EN 61000-4-2	4/8kV
	EN 61000-4-3 A1	3V/m
	EN 61000-4-4	1kV/0.5kV
	EN 61000-4-5	2kV/1kV
	EN 61000-4-6	3 Vrms
	EN 61000-4-11	>95%-0.5p, 30%-25p,>95%-250p
EN 61000-3-2		Class A
EN 61000-3-3		

USA, Friday, September 30, 2005

Kenneth Stuart Hansen, Compliance Engineer

Product Modification Warning

High End Systems products are designed and manufactured to meet the requirements of United States and International safety regulations. Modifications to the product could affect safety and render the product non-compliant to relevant safety standards.

Mise En Garde Contre La Modification Du Produit

Les produits High End Systems sont conçus et fabriqués conformément aux exigences des règlements internationaux de sécurité. Toute modification du produit peut entraîner sa non conformité aux normes de sécurité en vigueur.

Produktmodifikationswarnung

Design und Herstellung von High End Systems entsprechen den Anforderungen der U.S. Amerikanischen und internationalen Sicherheitsvorschriften. Abänderungen dieses Produktes können dessen Sicherheit beeinträchtigen und unter Umständen gegen die diesbezüglichen Sicherheitsnormen verstoßen.

Avvertenza Sulla Modifica Del Prodotto

I prodotti di High End Systems sono stati progettati e fabbricati per soddisfare i requisiti delle normative di sicurezza statunitensi ed internazionali. Qualsiasi modifica al prodotto potrebbe pregiudicare la sicurezza e rendere il prodotto non conforme agli standard di sicurezza pertinenti.

Advertencia De Modificación Del Producto

Los productos de High End Systems están diseñados y fabricados para cumplir los requisitos de las reglamentaciones de seguridad de los Estados Unidos e internacionales. Las modificaciones al producto podrían afectar la seguridad y dejar al producto fuera de conformidad con las normas de seguridad relevantes.

Important Safety Information

Instructions pertaining to continued protection against fire, electric shock, and injury to persons are found in Appendix C. Please read all instructions prior to assembling, mounting, and operating this equipment.

Important: Informations De Sécurité

Les instructions se rapportant à la protection permanente contre les incendies, l'électrocution, excessif et aux blessures corporelles se trouvent dans l'Annexe C. Veuillez lire toutes les instructions avant d'assembler, de monter ou d'utiliser cet équipement.

Wichtige Sicherheitshinweise

Sicherheitsanleitungen zum Schutz gegen Feuer, elektrischen Schlag, und Verletzung von Personen finden Sie in Anhang C. Vor der Montage, dem Zusammenbau und der Intbetriebnahme dieses Geräts alle Anleitungen sorgfältig durchlesen.

Informazioni Importanti Di Sicurezza

Le istruzioni sulla protezione da incendi, folgorazione, e infortuni sono contenute nell'appendice C. Si prega di leggere tutte le istruzioni prima di assemblare, montare e azionare l'apparecchiatura.

Informacion Importante De Seguridad

En el Apéndice C se encuentran instrucciones sobre protección continua contra incendios, descarga eléctrica, y lesiones personales. Lea, por favor, todas las instrucciones antes del ensamblaje, montaje y operación de este equipo.

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed

and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Safety Symbols

The following international caution and warning symbols appear in margins throughout this manual to highlight messages.

CAUTION: This symbol appears adjacent to Caution messages. Not heeding these messages could result in personal injury and/or damage to equipment.

WARNING: This symbol appears adjacent to high voltage warning messages. Not heeding these messages could result in serious personal injury.

This symbol indicates the minimum focus distance from a combustible object.

This symbol cautions against mounting the fixture on a flammable surface.

This symbol indicates that, while operating, equipment surfaces may reach very high temperatures. Allow the fixture to cool before handling.

Warranty Information

Limited Warranty

Unless otherwise stated, your product is covered by a one year parts and labor limited warranty. Dichroic filters and LithoPatterns® high resolution glass gobos are not guaranteed against breakage or scratches to coating. It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.

Returning an Item Under Warranty for Repair

It is necessary to obtain a Return Material Authorization (RMA) number from your dealer or point of purchase BEFORE any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. Lamps are covered by the lamp manufacturer's warranty.

Any Product unit or parts returned to High End Systems must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts and with an RMA number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction. Ship returned Product units or parts to: 2105 Gracy Farms Lane, Austin, TX 78758 USA.

Note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.

Freight

All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the Continental United States. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the Continental United States.

REPAIR OR REPLACEMENT AS PROVIDED FOR UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. HIGH END SYSTEMS, INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO ANY PRODUCT, AND HIGH END SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGH END SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGE, INCLUDING LOST PROFITS, SUSTAINED OR INCURRED IN CONNECTION WITH ANY PRODUCT OR CAUSED BY PRODUCT DEFECTS OR THE PARTIAL OR TOTAL FAILURE OF ANY PRODUCT REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, AND WHETHER OR NOT SUCH DAMAGE WAS FORESEEN OR UNFORESEEN.

Warranty is void if the product is misused, damaged, modified in any way, or for unauthorized repairs or parts. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Patents

This product may use one or more of the following patents: US 4,392,187; US 4,602,321; US 4,688,161; US 4,701,833; US 4,709,311; US 4,779,176; US 4,800,474; US 4,962,687; US 4,972,306; US 4,980,806; US 5,010,459; US 5,031,078; US 5,073,847; US 5,078,039; US 5,186,536; US 5,209,560; US 5,278,742; US 5,282,121; US5,307,295; US 5,329,431; US 5,331,822; US 5,367,444; US 5,402,326;US 5,430,629; US 5,432,691; US 5,454,477; US 5,455,748; US 5,506,762; US 5,515,254; US 5,537,303; US5,545,951; US 5,580,164; US 5,590,954; US 5,590,955; US 5,640,061; US 5,647,662; US5,665,305; US 5,691,886; US 5,728,994; US 5,758,955; US 5,758,956; US 5,769,527; US5,774,273; US 5,798,619; US 5,806,951; US 5,823,661; US 5,825,548; US5,828,485; US 5,829,868; US 5,857,768; US 5,882,107; US 5,934,794; US 5,940,204; US 5,945,786; US5,953,152; US 5,980,066; US 6,048,080; US 6,327,103; US 6,048,081; US 6,057,958; US6,054,816; US 6,126,288; US 6,142,652; US 6,172,822; US 6,188,933;US 6,208,087; US 6,219,093; US 6,220,730; US 6,241,366; US 6,255,787; US 6,256,136; US 6,278,542; US6,288,828; US 6,327,103; US 6,421,165; US 6,430,934; US 6,466,357; US 6,502,961; USD347,113; US D350,408; US D359,574; US D360,404; US D365,165; US D366,712; US D370,080; US D372,550; US D377,338; US D381,740; US D409,771; US 6693392; US 6719433; EP 0662275; EP 0767398; DE 621495; DE 655144; DE 797503; EP 0475082; GB 2 043 769 B; GB 2 055 842 B; GB 2 283 808 B; GB 2 290 134 B; GB 2 291 814 B; GB 2 292 530 B; GB 2 292 896 B; GB 2 294 909 B; GB 2 295 058 B; GB 2 303 203 B; GB 2 306 887 B; GB 2 307 036 B; GB 2 316 477 B; MR0862-1996; M9,604,224.9

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Chapter I:

Product Overview

The Studio Command fixture is a powerful washlight featuring a large exiting beam with a compact head that uses a patented lenticular array optical system to enhance the homogeneity of the projected light. The proven long-life MSR 700 lamp emitting 55,000 lumens (at 5900K) is shipped as a standard complement providing deep and powerful reds. Alternatively the MSR 700/2 lamp emitting 55,000 lumens (at 7200K) can also be fitted in the field. The CMY dichroic color-mixing system provides rapid and quiet color changes, and the mechanical douser provides a smooth fade to black.

The moving yoke fixture features an adjustable field angle from 18 to 32 degrees. It also offers a variable mechanical and electronic strobe, boosted with the Light Burst™ effect.

The Studio Command uses 14 channels for DMX512 control, as well as providing an option for standalone programming.

All Studio Command fixtures support **TalkBack™** technology. Any DMX console supporting TalkBack protocol can remotely access every option in the Studio Command onboard menu system.

Studio Command™ Features

Fixture

- 540° pan 240° tilt
- Optical encoders to automatically correct the beam's position if the fixture's head is jarred from its programmed position.
- Integral, fully variable zoom adjustable from 8° - 13° beam angle and an 18° - 32° field angle
- Shutter construct parameters including ramp/snap, synchronous, and random functions.
- Time code synchronization in stand-alone mode via master/slave links to any combination of xSpot® Xtreme, Technobeam®, Studio Spot®, Studio Color®, Studio Color® 250, Studio Spot® 250, Studio Beam®, and Studio Command™ fixtures.
- Smooth full-field dimming without changing color temperature or beam shape.
- Electronic strobe in addition to a variable conventional strobe to 10 Hz.
- DMX analyzer for easy DMX troubleshooting.
- Lamp interlock douses the lamp if the lamp cap is opened while the lamp is on.
- Full optical dimming and fade-to-black.
- Remote fixture power up and shut down.
- Light burst lamp boosting and lightning effects.

Operation

- High-resolution DMX512 programming control.
- TalkBack protocol support for remote fixture control.
- Fat output beam (8 inches (200 mm) in diameter)
- Fully dichroic colors that never fade
- Full control over color mixing from smooth, stepless movement (allowing slow, imperceptible color fades) to rapid snap color changes
- Quiet performance even during snap color changes
- Even, soft-edged wash with good beam distribution for easy blending
- Live color fading from one color to another at any speed
- On-board Preset DMX programming via the fixture's menu system for stand-alone operation.
- Easy-to-program alphanumeric LED (light emitting diode) display.
- Two user modes (A and B), each with an on-board 16-scene memory for a total of 32-scene memory per fixture in stand-alone mode.
- DMX macro channel factory-programmed with four Internal Effects™ macros.
- Selectable audio modulation adjusts fixture movement to sound amplitude for all fixture parameters except Pan, Tilt, and Zoom.

Construction

- Exterior design minimizes light leakage.
- Universal power supply automatically selects the appropriate voltage for the fixture (100V - 230V at 50-60 Hz).
- Both 3-pin and 5-pin XLR connectors.
- Exclusive High End Systems, Inc. multi-phase technology for stunningly fast, smooth, and quiet yoke movement.
- LED status indicators streamline troubleshooting.
- Precision stepper motors control dimmer, shutter function, and color mixing.
- Compact and lightweight

Related Products and Accessories

The following table lists other products you can utilize with the Studio Command and optional accessories available from your High End Systems dealer/distributor.

Part Description	Part Number
Whole Hog® III Lighting Console	25020001
Hog iPC Lighting Console	74020001
Replacement MSR 700/2W lamp	55030048
Replacement MSR 700W lamp	55030069
Heavy duty 3-pin XLR cable (10')	55050005
Heavy duty 3-pin XLR cable (25')	55050006
Heavy duty 3-pin XLR cable (50')	55050007
Heavy duty 3-pin XLR cable (100')	55050008
Heavy duty 5-pin XLR cable (10')	55050017
Heavy duty 5-pin XLR cable (25')	55050018
Heavy duty 5-pin XLR cable (50')	55050019
Heavy duty 5-pin XLR cable (100')	55050020
Upload Dongle	26040002
Galvanized safety cable	12040001
Cheeseborough clamp	55040014
30" Safety Cable w/ spring clip	12040001

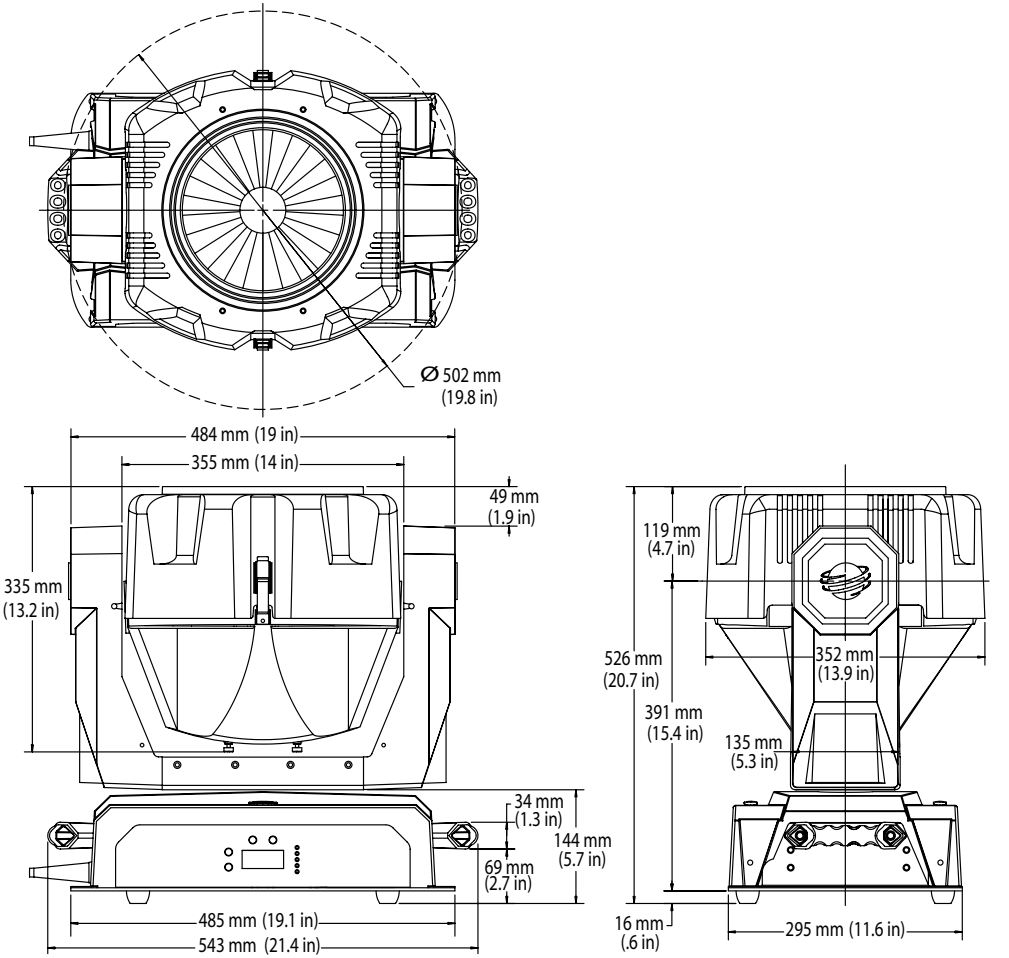
[1]For more information about optional accessories, contact either your High End Systems® dealer/distributor, High End Systems Sales, or visit the High End Systems Web site. For contact information, see *Contacting High End Systems*® on page ii.

Specifications

Mechanical

Dimensions: 600mm x 485mm x 295 mm
23.62in x 19.1in x 22.6in

Weight: 21 kg (55 lbs)

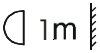


Environmental

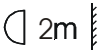
Maximum ambient temperature, (T_a): 50° C (122° F)

Maximum exterior surface temperature: 160° C (320° F)

WARNINGS:



Minimum distance to flammable objects: 3.28 ft (1.0 m)



Minimum distance to lighted object: 6.56 ft (2.0 m)

Do not mount on a flammable surface.

Electrical

Voltage Range: 100-230V, 50-60 Hz, 4.35A–10A

Power Consumption: 1000 W maximum

Logic Board Fuses:

F1 - 2.5A, 250V, Slow Blow only (5 mm x 20 mm)

F2 - 2.5A, 250V, Slow Blow only (5 mm x 20 mm)

Motor Power Supply Fuses:

F1 - 6.3A, 250V, Slow Blow only (5 mm x 20 mm)

F2 - 6.3A, 250V, Fast Blow only (5 mm x 20 mm)

Filter Board Fuses:

F1 - 16A, 250V, Fast Blow only (5 mm x 20 mm)

F2 - 16A, 250V, Fast Blow only (5 mm x 20 mm)

Voltage Surge: A surge of 2000V or more may damage the power supply.

Warning: Class 1 equipment - This equipment must be earthed.

Cable and Connector Specifications

DMX data cables:

Belden® 9841 or equivalent (meets specifications for EIA RS-485 applications) with the following characteristics:

- 2-conductor twisted pair plus a shield
- maximum capacitance between conductors - 30 pF/ft.
- maximum capacitance between conductor and shield - 55 pF/ft.
- maximum resistance of 20Ω / 1000 ft.
- nominal impedance 100-140Ω

DMX data connectors: 3-pin or 5-pin male and female XLR connectors

DMX data terminators: Male XLR connector with 120 ohm terminator

Lamp Specifications

	Primary Lamp	*Alternate Lamp*
Lamp:	PHILIPS MSR700	PHILIPS MSR700/2
Luminous Flux	56000 LUMENS	55000 LUMENS
Arc Length	8 mm	8 mm
Color Temperature	5600K	7200K
Lamp Life 50%	1000 hrs	1000 hrs
CRI	95	80
CIE	X=.330; Y=.330	X=.302; Y=.320

Chapter 2:

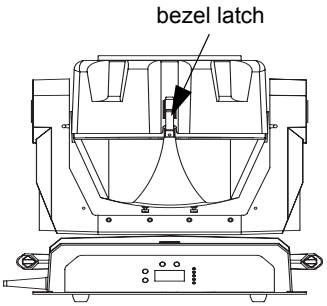
Setup and Configuration

Unpacking the Fixture

Unpack your Studio Command™ fixture and verify that it arrived undamaged. Inspect both the outside of the fixture for physical damage and the inside of the fixture for damage to glass components.

To access the internal components, release the two bezel latches (one latch located on each side of the fixture's head) and remove the bezel.

If the fixture is damaged, notify both the shipping agent and your sales agent immediately.



Removing the bezel

Do not discard the shipping carton and packing materials. The carton and packing materials are specifically designed to protect the product during transport.

High End Systems assumes no responsibility for products that have been damaged during transport. Therefore, you should return a product for repair in its original shipping carton and packing materials.

> ***Note: Before sending anything to the factory, call your High End Systems dealer/distributor for a Return Material Authorization (RMA) number. The factory cannot accept any goods shipped without an RMA number.***

Changing the Attachment Plug

Studio Command fixtures are shipped with a molded attachment plug. However, different locations (even within the same country) may require a different attachment plug to connect your fixture to a power outlet. Because of the variety of attachment plugs used worldwide, High End Systems, Inc. cannot make specific recommendations for the particular attachment plug you should use. Contact a local authority if you are unsure which type of attachment plug you need to obtain. If you need to replace the attachment plug, note that the cores in the mains lead are colored according to the following code:

- green and yellow = earth
- blue = neutral
- brown = live

Warning: Class 1 equipment - This equipment must be earthed.

Installing an Attachment Plug - U.K. Only

In the United Kingdom, the colours of the cores in the mains lead of this equipment may not correspond with the colored markings identifying the terminals in your plug. Therefore, install an attachment plug in accordance with the following code:

- The core which is coloured green and yellow must be connected to the plug terminal which is marked with the letter "E," or by the earth symbol ⏚, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal which is marked with the letter "N" or coloured black.
- The core which is coloured brown must be connected to the terminal which is marked with the letter "L" or coloured red.

Vigtig Fikker Heds Information - Danmark

Advarsel: Beskyttelse mod elektrisk chock.

Vigtigt!

Lederne med gul/groen isolation maa kun tilsluttes en klemme maerket ⏚ eller ⏚

Powering On the Fixture

Warning: This equipment is designed for connection to a branch circuit having a maximum overload protection of 20 A.

Studio Command fixtures do not have a power switch. To power on the fixture, simply connect it to an appropriately-rated power source. Once connected, you can remotely power up or shutdown the fixture via controller commands (see *Control Parameter* on page 54). However, it is very important that you disconnect power to the fixture before performing certain procedures shown in this manual.

When you connect any Studio Command to an appropriately-rated power source, the fixture automatically begins a homing procedure. You can also remotely home the fixture via a DMX controller (see *Control Parameter* on page 54) or manually home the fixture via the on-board menu system (see *Homing the Fixture (HOME)* on page 33).

The fixture's homing procedure verifies that the major functions of the fixture (color wheels, frost flags, and shutter) are correctly oriented. The homing procedure is also used to take the fixture out of shutdown mode. During the homing process, you will hear clicking sounds as the wheels, flags, and shutter seek their home position.

Mounting the Fixture

Warnings: Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.

Do not mount on a flammable surface.

Use a secondary safety cable when mounting this fixture.

Maintain a minimum distance of 1 m (3.28 ft.) from combustible materials.

Maintain a minimum distance of 2 m (6.56 ft.) from lighted object. This means the fixture must be positioned at least 2 meters away from the object it is illuminating.

You can mount Studio Command fixtures either upright (on the fixture's base) or in any orientation suspended from a support system (such as a truss). Follow the instructions below for the mounting orientation you choose.

Mounting the Fixture Upright

To mount the fixture upright, make sure that all four rubber feet are installed on the fixture's base and place the fixture on a sturdy, stable surface.

If the surface is above floor height, use safety cables to secure the fixture to the surface. Install the safety cable(s) by looping the cables around a support on the surface, through the side holes in the fixture's base, and around the fixture's handles. Make sure the support and cables can support the weight of the fixture 21 kg (55 lbs).

Caution:

Do not mount the fixture upright without the four rubber feet installed.

Mounting the Fixture on a Truss

You will need:

- truss or other support system
- safety cables (2)
- clamps (2)
- locking washers (2)

Truss or Other Support System

If you are mounting the fixture(s) on a truss or another type of support, verify the truss or support will handle the weight of *all* the devices you are mounting. The Studio Command fixture weighs 21 kg (55 lbs).

Safety Cable

High End Systems strongly recommends that you use safety cable when mounting any fixture. You must supply your own safety cable and verify the cable is capable of supporting the weight of the fixture. You can order galvanized safety cables from your High End Systems dealer/distributor (see *Related Products and Accessories* on page 3).

Clamp

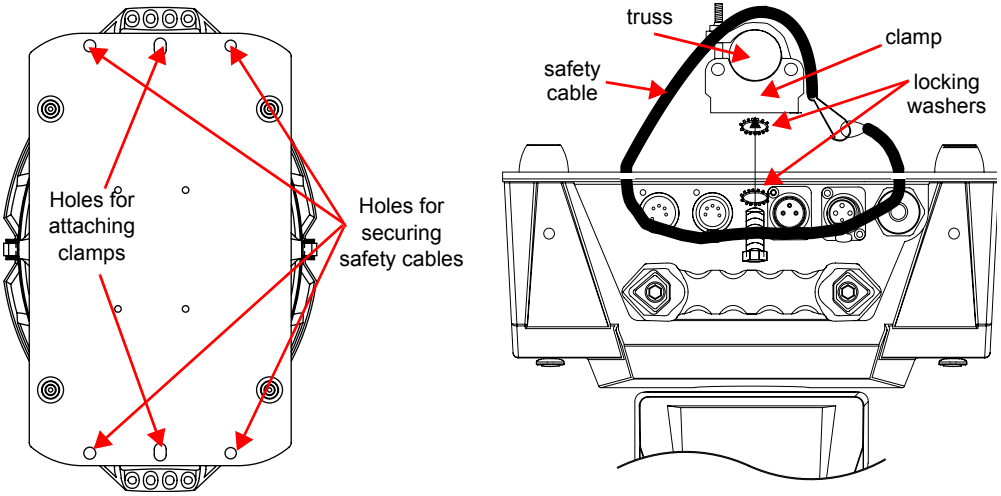
You must supply your own clamps and verify the clamp is capable of supporting the weight of the fixture. You can order deluxe C-clamps for a two-inch truss from your High End Systems dealer/distributor (see *Related Products and Accessories* on page 3).

Mounting Procedure

Note: Due to the wide variety of possible lighting designs, High End Systems cannot make specific mounting recommendations. Consider the following procedure as a suggested guideline only.

To mount Studio Command fixtures on a truss:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Always stand on a firm, stable surface when mounting a fixture to its support. The fixture should be at a height where you can comfortably work on it, and should either be resting on a stable surface, or held securely.
3. Attach suitable clamps through the center holes on the base of the fixture. *Install two locking washers per clamp when attaching the clamps to the fixture's base.*
4. Tighten the clamps firmly to the fixture's base and to the support.
5. Loop one or more suitable safety cables around the support, through the side holes in the fixture's base, and around the fixture's handles.



Attaching a clamp and safety cable to the fixture

Linking the Fixtures

The combined number of channels required by all the fixtures on a DMX 512 link determines the number of fixtures the link can support. Each Studio Command fixture uses 14 channels on a DMX512 link.

> ***Note:*** ***If you connect more than 32 fixtures to a link, you must use a DMX splitter. The 32 device limit complies with the EIA-485 standard. Connecting more than 32 devices per link without a DMX splitter will eventually deteriorate the digital signal.***

Controllers, serial data distributors, data line optoisolators, and any fixtures using the RS-422 DMX standard of serial communications block software uploads, crossloads, or TalkBack™ protocol on a link. Therefore, make sure you either put all of these devices after the Studio Command fixture on the link, or bypass these devices when you perform software uploads or crossloads

Data Cabling and Connectors

To link one or more fixtures to a controller and/or to each other, you must obtain data cabling. You can either purchase cabling from High End Systems (see *Related Products and Accessories* on page 3) or construct your own cabling.

If you choose to construct cabling, High End Systems recommends that you use data-grade cable. Data-grade cable is designed to carry a high-quality signal with less susceptibility to electromagnetic interference.

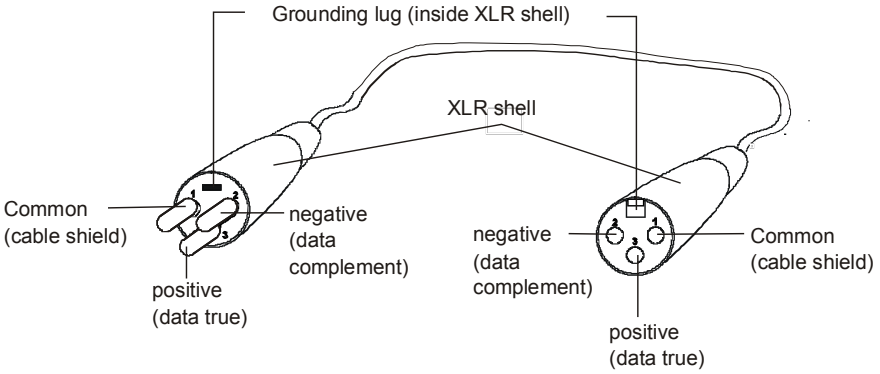
DMX data cables:

Belden® 9841 or equivalent (meets specifications for EIA RS-485 applications) with the following characteristics:

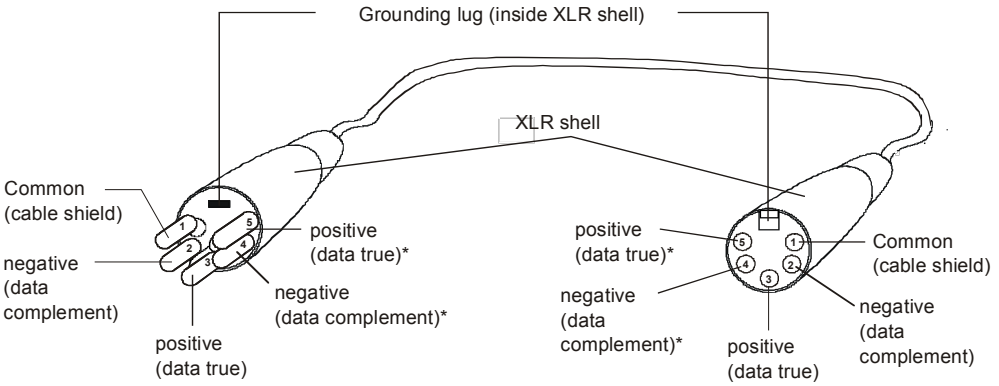
- 2-conductor twisted pair plus a shield
- maximum capacitance between conductors - 30 pF/ft.
- maximum capacitance between conductor and shield - 55 pF/ft.
- maximum resistance of 20Ω / 1000 ft.
- nominal impedance 100-140Ω

Cable Connectors:

Studio Command fixtures can accept either 3-pin or 5-pin XLR cable connectors. Your cabling must have a male XLR connector on one end of the cable and a female XLR connector on the other end. The following diagram shows the pin configuration for both cable types.



Male 3-pin XLR Connector **Female 3-pin XLR Connector**



**This data line is not used by the fixture, but allows data to pass through the fixture.*

Male 5-pin XLR Connector **Female 5-pin XLR Connector**

Pin configuration for 3-pin and 5-pin XLR cables

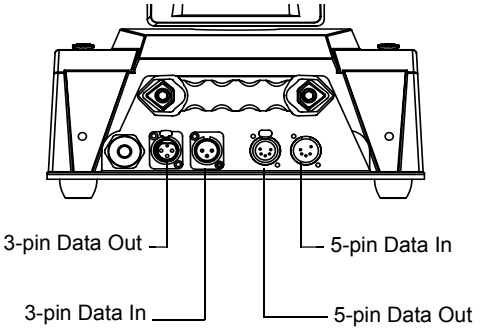
Test each cable with a voltage/ohm meter (VOM) to verify correct polarity and to make sure that the negative and positive pins are not grounded or shorted to the shield or to each other.

Caution: Do not connect anything to the ground lug on the XLR connectors. Do not connect or allow contact between the common (cable shield) and the fixture's chassis ground. Grounding the common could cause a ground loop and/or erratic behavior.

Setting Up a DMX Link

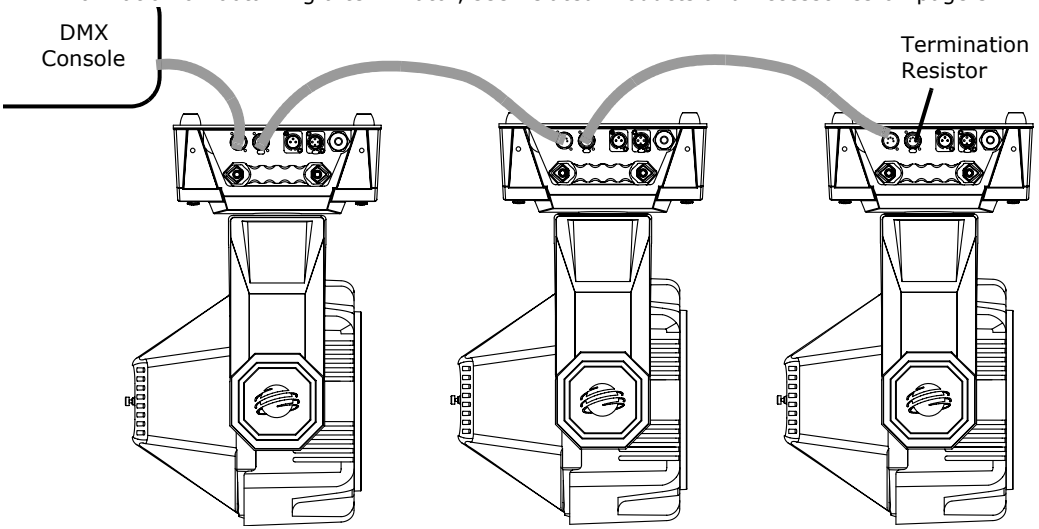
To link one or more fixtures to a controller using either 3-pin or 5-pin XLR cables:

1. Connect the male XLR connector of a DMX Data cable to the controller's DMX Data Out connector.
2. Connect the Data cable's female XLR connector to the Data In connector of the first (or next) fixture on the DMX link.
3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.



Data cable connectors on the Studio Command™ fixture's side panel

4. Connect a male terminator to the Data Out connector of the last fixture in the link. For information on obtaining a terminator, see *Related Products and Accessories* on page 3.

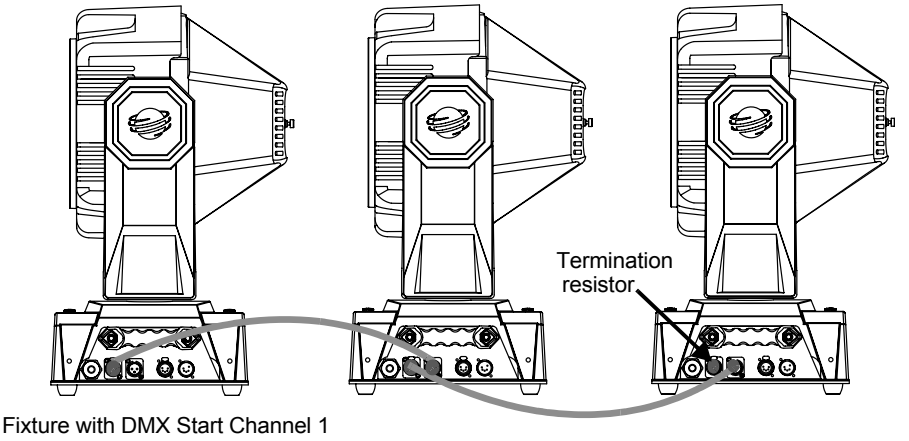


Connecting to a DMX link using 5-pin connectors

Standalone Fixture Linking

To link one or more fixtures to a controller using either 3-pin or 5-pin XLR cables:

1. Connect the male XLR connector of a DMX Data cable to the Data Out connector on the fixture addressed at DMX Start channel 1.
2. Connect the cable's female XLR connector to the Data In connector of the next fixture on the DMX link.
3. Continue linking the remaining fixtures connecting a cable from the Data Out connector of each fixture to the Data In connector of the next fixture on the link.
4. Connect a male terminator to the Data Out connector of the last fixture in the link. For information on obtaining a terminator, see the following section.



Linking without a controller using 3-pin data cables

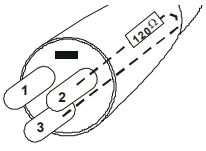
Caution: Do *not* connect more than one Data In and one Data Out connector to each fixture.

Terminating the Link

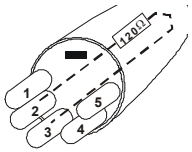
You must install a 120 ohm, 1/4 watt (minimum) terminator in the fixture's Data Out (female) cable connector in the *last* fixture on each DMX link. If you plan to control your fixtures in stand-alone mode (with no controller on the link), you must also install a female terminator in the Data In cable connector on the *master* fixture (the fixture assigned to DMX start channel 1). A terminator will prevent data reflection, which can corrupt the data communication on the link.

Use the following steps to construct a terminator.

1. Obtain and disassemble a 3-pin or 5-pin XLR connector.
2. Solder a 120 ohm resistor, minimum of 1/4 watt, between pins two and three.
3. Reassemble the XLR connector.



3-pin terminator



5-pin terminator

Uploading Latest Fixture Software

The latest software for Studio Command fixtures is available in the support section of the HighEnd Systems web site (**www.highend.com/support**). There are three ways to upload new software to Studio Command fixtures:

1. Attach a High End Systems Upload Dongle to your computer and upload the software to your Studio Command fixture.

   To use a High End Systems Upload Dongle, you need a 386-based (or faster) computer, MS DOS® version 3.3 (or later) or Windows 95/98, and one MB of free disk space. To obtain an Upload Dongle (with installation and operation instructions), contact your High End Systems dealer/distributor (see *Related Products and Accessories* on page 3).

2. Upload the new software to all Studio Command fixtures on the link using a Hog iPC console or a Wholehog III console.

3. Crossload software from one fixture that contains the new software to all other Studio Command fixtures on the link, (see *Crossloading Fixture Software (XLD)* on page 32.

Note: ***Before you can upload new software, you must disconnect any controllers, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes, and Intellabeam® fixtures) are located after the Studio Command fixtures on the link. These devices will block communication with any other Studio Command fixtures on the link.***

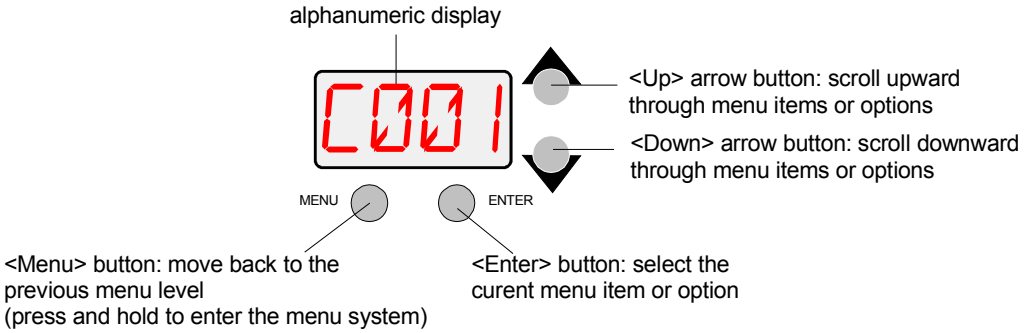
Assigning a DMX Start Channel

The DMX start channel identifies each fixture on a DMX link. If you plan to control your fixtures with a DMX console (or using synchronized preset playback), you must assign a DMX start channel to each fixture on the link.

If you *always* plan to use the fixture in stand-alone mode (without a controller or synchronized preset playback), you can skip this section.

There are 512 available channels on each DMX link. These 512 channels are divided among *all* the devices on a particular link. The number of channels a fixture requires on the link is the fixture's channel range. Studio Command fixtures require a 14-channel range. The DMX start channel is the first channel available to a fixture in its channel range.

To assign a DMX start channel, you must access the fixture's menu system via the alphanumeric LED display and four menu navigation buttons on the fixture's front panel.


alphanumeric display
C001
<Up> arrow button: scroll upward through menu items or options
<Down> arrow button: scroll downward through menu items or options
MENU
ENTER
<Menu> button: move back to the previous menu level (press and hold to enter the menu system)
<Enter> button: select the curent menu item or option

The fixture's channel range must not overlap any other device's channel range on the link.* When two devices on the same DMX link have overlapping channel ranges, one or both devices will be disabled or behave erratically.

Note:** **The single exception to the non-overlapping rule is if you want the fixtures to respond to controller commands in exactly the same way. In this case, the fixtures must be the same type (for example, two Studio Command fixtures) and the fixtures must share the entire channel range.

To assign the start channel:

1. Press and hold <Menu> until *AddR* appears on the LED display. Press <Enter> to select.

to

2. Scroll to the desired DMX start channel (*C001– C512*)
3. Press <Enter> to store selection.

Determining the DMX Start Channel

DMX Link with Multiple Fixture Types

This section describes how to determine start channels for the fixtures on a DMX link if you plan to mix different fixture types (for example, a Studio Command fixture and a Studio Spot 250 fixture) on the same DMX link.

To determine each fixture's DMX start channel in a link, you must know the number of channels used by each fixture. Knowing that the first fixture on the link will use DMX start channel 1, you can determine the DMX start channel for each successive fixture by adding the number of DMX channels used by the fixture to the fixture's DMX start channel. For example, in the following table, 14 (channels used by Studio Command running) + 1 (DMX start channel for the first fixture) = 14 (DMX start channel for the next fixture on the link).

Fixture location on the link	Fixture name	Number of DMX channels used per fixture	DMX start channel	Channel range used
First	Studio Command	14 channels	C001	1-14
Second	Other device	9 channels	C015	15-23
Third	Other device	20 channels	C024	24-43
Fourth	Studio Command	14 channels	C044	44-52

Note: ***The fixture location on the link does not have to comply with this example. The fixtures can be addressed in any order on the link. The maximum Start channel for the last Studio Command fixture on a DMX512 link is 498 (channel range 498-512).***

Note: ***If you connect more than 32 fixtures to a link, you must use a DMX splitter. The 32 device limit complies with the EIA-485 standard. Connecting more than 32 devices per link without a DMX splitter will eventually deteriorate the digital signal.***

Chapter 3:

The Menu System

On-Board Programming Capability

When you use the fixture's on-board menu system to program the Studio Command™ fixture, you manually assign a value to each of the fixture's available parameters.

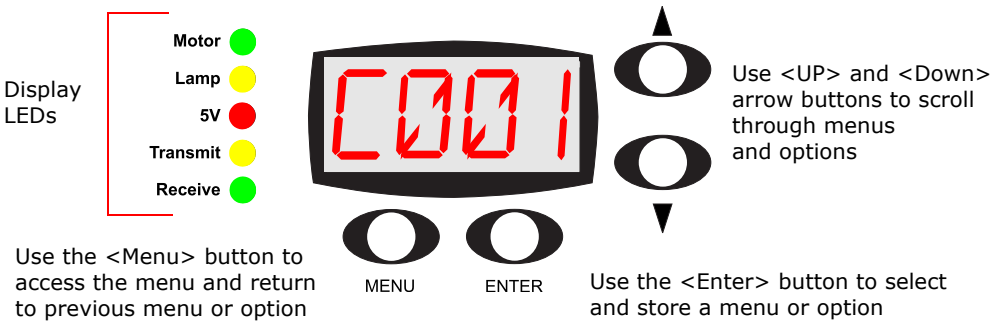
The onboard Studio Command menu system allows you to:

- Assign a DMX start channel.
- Access fixture options such as homing the fixture, viewing fixture status, crossloading software, and performing self tests.
- Create, store, and play scenes from the fixture's on-board memory.

For a full menu map of the Studio Command menu system, see *Appendix D: Menu Map*.

Navigating the Menu System

Access the menu system via the four menu navigation buttons on the fixture's front panel



Menu navigation buttons.

The alphanumeric LED display shows the menu items you select from the menu map. When accessing fixture options (not preset scenes), the display will flash when a new option is *selected* (by pressing the <Up> or **<**Down**>** arrow buttons) and stops flashing when a new option is *stored* (by pressing the **<**Enter**>** button).

To access the menu system, press and hold the <Menu> button until *AddR* appears on the display. The menu system is protected against inadvertent menu changes by requiring the <Menu> button to be held for a few seconds before allowing entry to the menu system.

To return to the previous option or menu *without changing* the value , press the **<**Menu**>** button.

To exit the menu system, keep pressing the <Menu> button until *MENU* appears on the display. MENU is replaced, after a few seconds, with the default display cycling the fixture's software version, fixture type, and DMX start channel.

Note: After you have accessed the menu system, the words AUTO and LOCK appear briefly on the display after TOP as the fixture's software is locking the display.

Studio Command Menu Options

The sections below explain how to access the fixture options shown in the fixture's menu map. This manual uses the following conventions in the descriptions for menus and menu navigation buttons:

Example	Meaning
<Button>	Press the appropriate LED display navigation button on the fixture. For example, the <Enter> button on the LED display panel.
Menu Option	Italics are used to indicate the appropriate menu selection you should choose from the on-board menu system. For example, the *AddR* menu option.

Address Menu (AddR)

The DMX start channel identifies each fixture on a DMX link. If you plan to control your fixtures with a DMX console (or using synchronized preset playback), you must assign a DMX start channel to each fixture on the link.

The Address menu allows you to change the DMX start channel that is currently assigned to the fixture. Be sure you do not overlap fixture channel ranges when changing the DMX start channel. For more information, see *Determining the DMX Start Channel* on page 17.

To change the DMX start channel:

1. Press and hold <Menu> until *AddR* appears on the LED display. Press <Enter> to select.

to

2. Select a new DMX start channel (*C001–C497*). The LED display flashes when a new option is selected.
3. Press <Enter> to accept the new DMX start channel. The LED display stops flashing when a new option is entered. If you do not press <Enter>, the new option you selected is not stored.

Preset Menu (PRST)

Studio Command fixtures have 16 preset scenes for each of two user modes (A and B) for a total of 32 preset scenes. Some Preset menu options can be accessed for either user mode. However, you must *first* set the fixture to User A or User B. For more information, see *Setting the User Type (USER)* on page 30.

The Preset menu allows you to turn preset playback off or on, view which scene is currently playing, create/edit a scene using the on-board memory to program the fixture for standalone operation, copy a scene from the on-board memory to another scene, and capture a scene from your DMX console to the on-board memory. This menu also allows you to enable the factory-programmed preset sequence.

For a detailed example of using Preset programming for Scene creation, Looping and Synchronizing Playback, see *page 42*.

Setting Preset Playback (PLAY)

This menu option allows you to view which scene is currently playing in preset playback mode or turn preset playback on or off. Before using this menu option, you need to have the user mode for the desired scene already selected, see *Setting the User Type (USER)* on page 30.

Note: Scene 1 must be programmed before the fixture can play back scenes.

To set Preset Playback on or off, or to view the current scene:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *PRST* menu and press <Enter> to select.

3. Scroll to the *PLAY* menu (this will be the first menu displayed). Press <Enter> to select.

or

or

4. Scroll to *ON* to set preset playback on,
   OFF to set preset playback off, or
   SCN to display which scene is currently playing.

5. Press <Enter> to store selection.

Editing or Creating an On-Board Memory Scene (EDIT)

This menu item allows you to select a scene to edit or create using the fixture's on-board scene memory. To used this menu option you need to have the user mode for the desired scene already selected, see *Setting the User Type (USER)* on page 30.

To select a scene to create or edit:

1. Press and hold <Menu> until AddR appears on the LED display.

2. Scroll to the *PRST* menu. Press <Enter> to select.

3. Scroll to the *EDIT* menu. Press <Enter> to select.

4. Scroll to the scene you want to create or edit (*SN01–SN16*).

to

5. Press <Enter> to store.

After a scene is selected, the value of any parameter for that scene can be changed. *Step-by-Step Scene Creation* on page 42 contains a detailed example of modifying scene parameters.

Copying an On-Board Memory Scene (COPY)

Use the Copy menu option to copy the settings for a source scene to a destination scene location. This menu option will copy between any of the 32 scene locations available.

To Copy a Memory Scene from one location to another:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *PRST* menu. Press <Enter> to select.

3. Scroll to the *COPY* menu. Press <Enter> to select.

4. The LED will display *FROM*. Press <Enter> to select.

5. Scroll to the scene you want to copy from (source scene) for either User A (*FA01–FA16*) or user B (*FB01–FB16*). This example indicates From User A Scene 01

6. Press <Enter>. The LED will display *TO*. Press <Enter> to select.

7. Scroll to the scene you want to copy to (destination scene) for either User A (*TA01–TA16*) or user B (*TB01–TB16*). This examples indicates To user B Scene 16

8. Press <Enter>. The fixture copies the desired scene to the selected scene location. When the copy is complete, *dONE* will appear briefly in the fixture's LED display.

Capturing a Preset Scene (CAPT)

Preset capturing is a way to automate the creation of scenes on multiple Studio Command fixtures connected to a DMX 512 link. Use a DMX console to create a scene, then save (capture) the scene into a fixture's presets to play back the scene without the console. When capturing a scene into a fixture's presets, all parameter values must be constant (i.e., there cannot be any pan/tilt movement or scene-to-scene sequencing). This menu option can be accessed for User Type A or B (see *Setting the User Type (USER)* on page 30).

Note:You must use the fixture's on-board scene memory to manually select values for the XFAD and DLAY parameters, since a DMX console will not transmit those parameter values.

After creating a scene with your DMX console, follow the instructions below for each fixture on which you want to capture preset scenes:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *PRST* menu. Press <Enter> to select.

3. Scroll to the *CAPT* menu. Press <Enter> to select.

to

4. Scroll to the scene you want to copy the preset scene to (destination scene) (*SN01–SN16*). Press <Enter>. The fixture will copy the DMX-512 console's preset scene to the selected scene on your fixture's on-board 16 scene memory for either User A or User B.

5. When the fixture finishes the capture successfully, *DONE* will appear briefly in the fixture's LED display.

Enabling the Preset Default (DFLT)

Enabling the Preset Default reverts all programming back to the factory-programmed preset default sequence. This menu option can be accessed for either User type A or User type B. However, you must *first* set the fixture to the desired user type. To retain pre-programmed scenes you do not wish to erase, set the fixture to one user type and then enable the preset default for the *other* user type (see *Setting the User Type (USER)* on page 30).

To enable the Preset Default:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *PRST* menu and Press <Enter> to select.

3. Scroll to the *dFLT* menu and Press <Enter> to select.

4. The LED display will show *OK?* Press <Enter>. The fixture plays the default sequence continuously until you press <Menu>.

Note: To play the fixture's default sequence, preset playback must be ON (see* Setting Preset Playback (PLAY) *on page 21.)

Set Menu (SET)

The Set menu allows you to lock the fixture, and either set all factory options to their default settings or access and change the factory options individually. The procedures below are listed in the same order shown on the menu map (see *Appendix D: Menu Map*).

Setting Factory Defaults (FACT)

When you set this menu item on, all factory options return to their default settings. Studio Command fixtures are shipped from the factory with the following default option settings:

pan/tilt swap = off	LED display = on and bright	shutter close with DMX data loss = short
tilt invert = off	LED display invert = off	fast pan/tilt movement = off
pan invert = off	lamp life warning = off	preset playback = off

Note: ***To change the preset playback option, see* Setting Preset Playback (PLAY) *on page 21.***

The factory default menu option displays *On* if all the factory options are at the factory default settings. If any of the items listed above are not at the factory default setting, the display reads OFF. Selecting the *OFF* option will have no effect. To restore the factory default setting:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *FACT* menu (this will be the first menu displayed). Press <Enter>.

4. Scroll to *ON* to restore the factory option defaults.
5. Press <Enter> to store.

Swapping Pan and Tilt (SWAP)

This menu option swaps the pan motor and tilt motor operation to allow fixtures hung perpendicular to each other to respond to pan and tilt movement commands in the same direction. To swap pan and tilt motion:

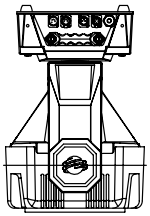
1. Press and hold <Menu> until *AddR* appears on the LED display.

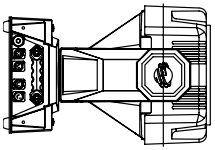
2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *SWAP* menu. Press <Enter> to select.

or

4. Scroll to *ON* to swap the fixture's pan and tilt motion, or *OFF* to return the fixture's pan and tilt motion to normal orientation.
5. Press <Enter> to store.

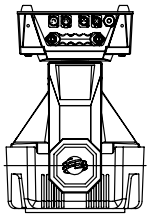




Fixture hung perpendicular to each other

Inverting Tilt (T/IN)

This menu item inverts the direction of the tilt motor, to allow fixtures mounted opposite each other vertically to respond to tilt movement commands in the same direction.



To invert the fixture's tilt motion:

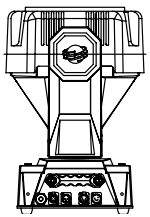
1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *T/IN* menu. Press <Enter> to select.

or

4. Scroll to *ON* to invert the fixture's tilt motion, or *OFF* to return the fixture's tilt motion to normal orientation.
5. Press <Enter> to store.



Vertically opposing fixtures

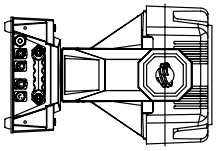
Inverting Pan (P/IN)

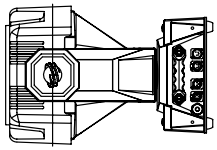
This menu item inverts the direction of the pan motor, to allow fixtures mounted opposite each other horizontally to respond to pan movement commands in the same direction.

To invert the fixture's pan motion:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.





Horizontally opposing fixtures

3. Scroll to the *P/IN* menu. Press <Enter> to select.

or

4. Scroll to *ON* to invert the fixture's pan motion, or *OFF* to return the fixture's pan motion to normal orientation.
5. Press <Enter> to store.

Changing the Display Output (DSPL)

You can manually change the appearance of the fixture's alphanumeric LED display, setting the display on or off, or dimming the display to reduce visibility. If you want to remotely change the display output (using a DMX console), see *Control Parameter* on page 54.

To change the display output:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *DSPL* menu. Press <Enter> to select.

or

or

4. Scroll to *ON* to set the LED display to normal intensity,
   OFF to turn the LED display off, or
   DIM to reduce the LED display visibility.
5. Press <Enter>.

Inverting LED Characters (D/IN)

To invert the orientation of the LED display's alphanumeric characters for viewing when the fixture is standing upright (i.e., resting on its bottom panel on the floor):

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *D/IN* menu. Press <Enter> to select.

or

4. Scroll to *ON* to invert the fixture's alphanumeric characters, or
   OFF to return the fixture's alphanumeric characters to normal orientation.
5. Press <Enter> to store.

Setting the Lamp Warning Message (LMPL)

Use this menu item to enable your fixture to display the warning message LAMP LIFE ERR when the current lamp hours exceed 700. With this option enabled, after the current lamp hours exceed 800 hours, the fixture will display the warning message LAMP OUT ERR. Once the lamp is extinguished, the fixture will no longer strike the lamp until the current lamp is replaced and the current lamp hours are reset to zero (see *Replacing the Lamp* on page 60 and *Resetting Lamp Hours (L/RS)* on page 40).

To enable the lamp warning message:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *LMPL* menu. Press <Enter> to select.

or

4. Scroll to *ON* to enable the lamp warning message, or OFF to disable the lamp warning message.
5. Press <Enter> to store.

Data Loss Shutter Close (DLOS)

Use this menu item to determine how the fixture will react in the event of DMX data loss by closing the shutter upon Data Loss or keeping the shutter open until shut down.

To select a shutter reaction to data loss:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *dLOS* menu. Press <Enter> to select.

or

4. Scroll to *LONG* to close the shutter only when the fixture is shut down, or *SHRT* to close the shutter one second after data loss.
5. Press <Enter> to store.

Increasing the Pan/Tilt Movement (FAST)

Use this menu item to increase the speed of the fixture's pan/tilt movement. Enabling this option will yield increased speed but may compromise the fixture's positioning. The *FAST* option works best in situations where you can allow the fixture to reach the target position before requesting the next target position.

To increase the pan/tilt movement:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *FAST* menu. Press <Enter> to select.

or

4. Scroll to *ON* to enable fast pan/tilt movement, or *OFF* to enable normal pan/tilt movement.
5. Press <Enter> to store.

Enabling Audio Modulation (ALED)

This menu options enables Audio modulation. A blinking decimal point indicates audio modulation is ON. The modulation is based upon sound amplitude rather than beat. Modulation will vary as the general sound level rises and falls. Audio modulation operates in conjunction with all fixture parameters except pan, tilt and zoom.

To set the audio:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *AdIO* menu. Press <Enter> to select.

4. Scroll to the *ALEd* menu. Press <Enter> to select.

5. Select *ON* to enable Audio Modulation. A blinking decimal will appear in display to indicate Audio Modulation is active when setting other parameters.
6. Press <Enter> to store.

Setting the Audio Gain (GAIN)

Use this menu item to place more or less emphasis on low sound levels. Any of 10 levels can be selected. The factory default setting is G006. The setting places more or less emphasis on low sound level with higher setting numbers providing more emphasis to low level sounds.

To set the Gain:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *SET* menu. Press <Enter> to select.

3. Scroll to the *AdIO* menu. Press <Enter> to select.

4. Scroll to the *GAIN* menu. Press <Enter> to select.

to

5. Scroll to a value between *G001* and *G010*. Higher setting numbers provide more emphasis to low level sounds.

6. Press <Enter> to store.

Mode Menu (MODE)

The Mode menu sets user type, copies settings and presets between user modes, and crossloads software versions from one fixture to all other Studio Command fixtures on the link. The procedures below are listed in the same order shown on the menu map (see *Appendix D: Menu Map*).

Setting the User Type (USER)

Use this menu item to change the fixture's user type between user A and user B. Each user type includes 16 different presets (scenes) and the following fixture settings:

Start Channel Number	Pan/Tilt Swap Status	Lamp Life Warning Status
Pan Invert Status	LED Display Status	Shutter Close with DMX Data Loss Status
Tilt invert Status	LED Display Invert Status	Preset Playback Status

Each user type can be configured with its own set of scene parameters and default fixture settings. These can be utilized, for example, when a fixture is moved between two locations. To change the user type:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *MODE* menu. Press <Enter> to select.

3. Scroll to the *USER* menu (this will be the first option displayed). Press <Enter>.

4. Scroll to *A* to select User A settings, or *B* to select User B settings.

or

5. Press <Enter> to store selections.

Copying User Presets (PRST)

Use this menu item to copy the fixture's preset scenes from one user mode to the other. Each user type includes 16 different presets which can be copied to the other user type. This options copies all 16 presets at one time. To copy just one preset, see *Copying an On-Board Memory Scene (COPY)* on page 22. To copy user presets:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *MODE* menu. Press <Enter> to select.

3. Scroll to the *USER* menu (this will be the first option displayed). Press <Enter>.

4. Scroll to the *COPY* menu. Press <Enter> to select.

5. Scroll to the *PRST* menu (this will be the first menu displayed). Press <Enter>.

6. Scroll to *A*⟶*B* to copy User A presets to User B, or *B*⟶*A* to copy User B presets to User A.

or

7. Press <Enter> to store selection.

Copying User Settings (SETT)

Use this menu item to copy the fixture's user settings from one user mode to the other. The user settings for each user type are listed in the section titled *Setting the User Type (USER)* on page 30. This options copies all user settings at one time.

To copy user settings:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *MODE* menu. Press <Enter> to select.

3. Scroll to the *USER* menu (this will be the first option displayed). Press <Enter>.

4. Scroll to the *COPY* menu. Press <Enter> to select.

5. Scroll to the *SETT* menu. Press <Enter> to select.

or

6. Scroll to A⟶B to copy User A settings to User B, or B⟶A to copy User B settings to User A.

7. Press <Enter>.

Copying User Presets and Settings (ALL)

Use this menu item to copy the fixture's 16 user preset scenes and fixture settings from User A to User B or vice versa. The user settings for each user type are listed in the section titled *Setting the User Type (USER)* on page 30.

Note: This options copies all user settings and all 16 presets at one time.

To copy user presets and settings:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *MODE* menu. Press <Enter> to select.

3. Scroll to the *USER* menu (this will be the first option displayed). Press <Enter>.

4. Scroll to the *COPY* menu. Press <Enter> to select.

5. Scroll to the *ALL* menu. Press <Enter> to select.

or

6. Scroll to *A⟶B* to copy User A presets and settings to User B, or *B⟶A* to copy all User B presets and settings to User A.

7. Press <Enter> to store selection.

Crossloading Fixture Software (XLD)

If you have a Studio Command fixture with a newer software version, you can crossload the newer software to all other Studio Command fixtures on the link.

Before crossloading, disconnect any consoles, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes and Intellabeam® fixtures) are located after the Studio Command fixtures on the link. These devices will block communication with any other Studio Command fixtures on the link.

To crossload software to all other Studio Command fixtures on the link:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *MODE* menu. Press <Enter> to select.

3. Scroll to the *XLD* option.
4. Press <Enter>. The fixture will upload its software to all other Studio Command fixtures on the link.

The Transmit LED on the crossloading fixture will remain on (or flicker) and the Transmit and Receive LEDs on receiving fixtures will flicker while the crossload is in progress.

The alphanumeric LED on the Studio Command fixtures will display *UPLD* as they are receiving the software upload. When the crossload has finished successfully, *DONE* will appear briefly in the LED display of the crossloading fixture, and all other fixtures will home.

Note: ***If a new boot code was included with the newer software, the alphanumeric LED will display a BOOT DIFF error. To correct the boot code, you must copy the new boot code for each fixture (see Copying the Boot Code (BOOT) on page 33).***

Test Menu (TEST)

The Test menu allows you to manually home the fixture, turn the lamp on or off, store new boot code information, and perform fixture self tests to determine the origin of mechanical problems.

Homing the Fixture (HOME)

This menu item allows you to manually home the fixture. To remotely home the fixture using a DMX console, see *Control Parameter* on page 54. To manually home the fixture:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select.

3. Scroll to the *HOME* option (this will be the first option displayed).
4. Press <Enter>. The LED will alternately display *RST* and *HOME* while the fixture homes.

Turning the Lamp On or Off (LAMP)

This menu item allows you to manually strike or extinguish the lamp. To remotely strike or extinguish the lamp using a DMX console, see *Control Parameter* on page 54. To manually turn the lamp on or off:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select.

3. Scroll to the *LAMP* menu. Press <Enter> to select.

4. Scroll to *ON* to strike the lamp, or *OFF* to extinguish the lamp.

or

5. Press <Enter>.

Copying the Boot Code (BOOT)

New software uploaded to Studio Command fixtures may contain a new boot code which must be copied to each BOOT section of the FlashROM. In this case, the LED displays a BOOT DIFF error. To accept and store the new boot code:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select.

3. Scroll to the *BOOT* option.
4. Press <Enter> to start the reboot. The fixture stores the new boot code, then automatically homes.

Note: Do not remove power from the fixture while performing a boot copy.

Performing Self Tests (SELF)

The following self tests are available:

Construct	Self-Test Description
ALL	performs all of the self tests listed below
PAN	moves the pan motor from 0° to 540°
TILT	moves the tilt motor from 0° to 240°
CYAN	divides the cyan color wheel into eight equal sections (positions) and rotates the cyan color wheel from position 1 through 8
MAGN	divides the magenta color wheel into eight equal sections (positions) and rotates the magenta color wheel from position 1 through 8
YELW	divides the yellow color wheel into eight equal sections (positions) and rotates the yellow color wheel from position 1 through 8
SHUT	performs strobe functions
DIM	moves the dim wheel from closed to fully open

To see the effects of the self tests, the lamp must be on. If the lamp is off when you run the self test, the LED will display LAMP to indicate that the lamp is not struck, and the fixture will attempt to strike the lamp automatically. Self tests run continuously until you until you press <Menu> to exit the test.To perform a self test:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select.

3. Scroll to the *SELF* menu. Press <Enter> to select.
4. Scroll to the desired option (listed above).
5. Press <Enter> to start the test. The fixture will perform the selected self test.
6. Press <Menu> to exit the test.

Placing the Fixture in Setup Mode (S/UP)

This menu item is used as part of the service procedure for replacing motor. To place the fixture in setup mode:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select

3. Scroll to the *S/UP* option.
4. Press <Enter>. When the LED displays *SET NOW,* the fixture mechanically homes the dim flags.
5. After mechanically homing press any button to reset and home the fixture.

Testing the LED Display (DISP)

To test the alphanumeric LED display:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select.

3. Scroll to the *DISP* option. Press <Enter> to select. The alphanumeric display runs through its self test.
4. Press <Menu> to exit the test.

Changing Encoder Operation (ENCD)

This menu option to disable the encoders which work to automatically correct the fixture's pan and tilt position if the fixture is moved from its programmed position. Use this option when performing maintenance, to prevent the fixture from repeatedly trying to correct its position.

To enable/disable the encoders:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *TEST* menu. Press <Enter> to select.

3. Scroll to the *ENCD* option. Press <Enter> to select.

4. Scroll to *ON* to enable the encoders, or *OFF* to disable the encoders.

or

5. Press <Enter> to store.

Information Menu (INFO)

The Information menu allows you to view current fixture information such as internal temperature, lamp hours, fixture hours, lamp strikes, software version, DMX errors, and DMX data for any other device on the link. You can also reset the lamp hours, lamp strikes and fixture hours. The procedures below are listed in the same order shown on the menu map (see *Appendix D: Menu Map*).

Viewing Sensor Information (SENS)

This menu option allows you to view whether a specified sensor is working correctly or to view encoder position values. If you receive a *SENS ERR* error message on the alphanumeric display, this information may help you determine where the problem originates

Sensor/encoder information is available for the following:

Parameter	Description
TILT	tilt sensor
PAN	pan sensor
TPOS	tilt encoder
PPOS	pan encoder

To view sensor and encoder information:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *SENS* menu. Press <Enter> to select.
4. Scroll to the desired sensor or encoder (listed above).
5. Press <Enter> to store the selection. If you are viewing a sensor, the LED will display *ON* or *OFF* indicating the status. If you are viewing an encoder, the LED will display the current numeric position of the encoder.

Viewing Fixture DMX Status and Parameter Values (FIXT)

This menu option allows you to view DMX status and parameter values for the fixture. You may want to view the DMX status and parameter values for a fixture if you are having a particular problem with a fixture; for example, a color wheel that does not respond to commands from the console.

The following DMX status information is available for viewing:

Contruct	DMX Status
BRKS	framing errors with value of zero (i.e. DMX breaks)
FE	framing errors with a non-zero value (i.e. errors in data transmission)
OV	overruns (changing values could indicate data link/connector problems)
STRT	start code

The following parameter values are available for viewing according to the protocol selected.

DMX Values Available for Viewing	
Construct	**Value**
PANH	high 16-bit pan value
PANL	low 8-bit pan value
TLTH	high 16-bit tilt value
TLTL	low 8-bit tilt value
COLC	color control value
LMPC	lamp control channel
CYAN	cyan color wheel position
MAGN	magenta color wheel position
YELW	yellow color wheel position
ZOOM	beam angle position
SHUT	shutter strobe value
DIM	shutter dim flag value
MSPD	MSpeed time value
MACR	macro value
CNTL	control channel value

To view the DMX status and parameter values:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *dMX* menu. Press <Enter> to select.

4. Scroll to the *FIXT* menu (this will be the first option displayed). Press <Enter>.
5. Scroll to the desired DMX status or parameter value.
6. Press <Enter>. The LED will display the selected DMX status or parameter value.

If you have a particular problem with the fixture, follow the steps above to select a parameter and view its value. After noting the value of the parameter you selected, use your DMX console to change that parameter's value.

If the value changes on the fixture's LED display, but the fixture still does not respond, contact High End Systems customer service in one of the ways shown in the section titled *Contacting High End Systems®* on page ii.

If the value does *not* change on the fixture's LED display, remove the fixture from the DMX link and try to change the parameter's value using the fixture's menu system. If the fixture then functions normally, the problem was likely with the DMX link. Otherwise, contact High End Systems customer service (see *Contacting High End Systems®* on page ii).

Viewing DMX Data for Another Device (DATA)

This procedure allows you to use a Studio Command fixture to view DMX channel values for other devices on the DMX link. Use this menu option for testing devices that do not have built-in DMX diagnostics, or fixtures that are physically inconvenient to monitor directly.

If you experience a problem with a device on the link, use this menu to select a DMX channel in the device's channel range and view its DMX value. After noting the value of the channel you selected, use your DMX console to change that channel's value.

If the value of the DMX channel you selected does not change, there may be a problem with the DMX cable or your transmitting device (i.e. DMX console).

If the DMX channel value changes, but the device does not respond, the device may be faulty. Consult the documentation provided with that device for more information.

To view DMX data for another device on the DMX link:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *dMX* menu. Press <Enter> to select.

4. Scroll to the *dATA* menu.Press <Enter>.

to

5. Scroll to the desired DMX channel (C001 – C512).

6. Press <Enter>. The LED will display the selected channel's DMX value.

Viewing the Current Logic Board Temperature (PCB)

This menu option allows you to view the current ambient temperature at the logic board inside the fixture.

To view the logic board temperature:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *TEMP* menu. Press <Enter> to select.

4. Scroll to the *PCb* option.
5. Press <Enter>. The LED will display the current internal temperature of the fixture's logic board in degrees centigrade.
6. The maximum temperature for the logic board is 85 C. When maximum temperature is exceeded, the fixture shuts down and the display shows *PCB TEMP ERR*. For more information, see *Alphanumeric Display Error Messages* on page 65.

Viewing the Current Fixture Head Temperature (HEAD)

This menu option lets you view the current ambient temperature inside the fixture head.

To view the fixture's head temperature:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *HEAD* option.
4. Press <Enter>. The LED will display the current internal temperature of the fixture's head in degrees centigrade.

Note: ***The maximum temperature for the fixture head is 100 C. If this maximum temperature is exceeded, the fixture will shut down and the alphanumeric display will show HEAD TEMP ERR. For more information, see* Alphanumeric Display Error Messages *on page 65.***

Resetting Fixture Hours (F/RS)

Use this menu to reset the recorded number of hours the fixture has been on.

To reset the fixture hours to zero:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *F/RS* option.
4. Press <Enter> to store the selection. The LED will display *0000* when the fixture hours are reset.

Note: This option has a five-second delay to avoid inadvertent changes. To reset the fixture hours, you must press and hold the <Enter> button for at least five seconds.

Viewing the Current Fixture Hours (F/HR)

To view the number of hours the fixture has been on since this option was reset:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *F/HR* option.
4. Press <Enter>. The LED will display the number of hours the fixture has been on.

Resetting Lamp Hours (L/RS)

This menu item resets the hours the current lamp has been operating to zero. You should reset the lamp hours each time you replace the lamp (see *Replacing the Lamp* on page 60).

To reset the current lamp hours to zero:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *L/RS* option.
4. Press <Enter>. The LED will display *0000* when the lamp hours are reset.

Note: This option has a five-second delay to avoid inadvertent changes. To reset the lamp hours, you must press and hold the <Enter> button for at least five seconds.

Viewing the Number of Current Lamp Strikes (L/ST)

To view the number of times the fixture has attempted to strike the current lamp:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *L/ST* option.
4. Press <Enter>. The LED will display the number of times the fixture has struck the current lamp.

Note: ***Lamp strikes are automatically reset when the lamp hours are reset*** ***(see* Resetting Lamp Hours (L/RS) *on page 40).***

Viewing the Current Lamp Hours (L/HR)

To view the number of hours the current lamp has been on:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *L/HR* option.
4. Press <Enter>. The LED will display the number of hours the current lamp has been on.

Viewing the Current Software Version (VER)

To view the current software version:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *INFO* menu. Press <Enter> to select.

3. Scroll to the *VER* option.
4. Press <Enter>. The LED will display the fixture's current software version.

Note: ***The software version is also displayed when you exit the menu system*** ***(see* Alphanumeric Display Error Messages *on page 65).***

Scene Creation, Looping and Playback Example

Step-by-Step Scene Creation

Use the following example to create a sample scene using the fixture's menu system to choose a value for each of the available parameters. For more information on available parameters, see *Appendix D: Menu Map*.

Choose a Scene to Create/Edit:

1. Press and hold <Menu> until *AddR* appears on the LED display.

2. Scroll to the *PRST* menu. Press <Enter> to select.

3. Scroll to the *EdIT* menu. Press <Enter> to select.

4. Scroll to the scene you want to create (in this example, *SN01*).
5. Press <Enter> to store the selection.

Select a Shutter Value (SHUT):

1. Scroll to the *SHUT* parameter (this will be the first parameter displayed). Press <Enter> to select.

2. Scroll to the desired shutter value (in this example, *OPEN*).
3. Press <Enter> to store the selection.

Select a Dim Value (DIM):

1. Scroll to the *dIM* parameter. Press <Enter> to select.

2. Scroll to the desired dim value (in this example, *d255*).
3. Press <Enter> to store the selection.

Select a Pan Value (PAN):

1. Scroll to the *PAN* parameter. Press <Enter> to select.

2. Scroll to a pan value from -49.9 to +49.9 (in this example, *+30.5*).
3. Press <Enter> to store the selection.

Select a Tilt Value (TILT)

1. Scroll to the *TILT* parameter. Press <Enter> to select.

2. Scroll to the desired tilt value from -49.9–+49.9 (in this example, *-20.3*).
3. Press <Enter> to store the selection.

Choose a Color Wheel Control Value (COLC)

1. Scroll to the *COLC* parameter. Press <Enter> to select.

2. Scroll to the desired color wheel control value (in this example, Continuous).
3. Press <Enter> to store the selection.

Select a Cyan Wheel Position (CYAN)

1. Scroll to the *CYAN* parameter. Press <Enter> to select.

2. Scroll to the desired cyan color saturation level (in this example, a DMX value of 203).
3. Press <Enter> to store the selection.

Select a Magenta Wheel Position (MAGN)

1. Scroll to the *MAGN* parameter. Press <Enter> to select.

2. Scroll to the desired magenta color saturation level (in this example, a DMX value of 60.
3. Press <Enter> to store the selection.

Select a Yellow Wheel Position (YELW)

1. Scroll to the *YELW* parameter. Press <Enter> to select.

2. Scroll to the desired yellow color saturation level (in this example, a DMX value of 255 or full saturation).
3. Press <Enter> to store the selection.

Select the Zoom Function (ZOOM)

1. Scroll to the *ZOOM* parameter. Press <Enter> to select.

2. Scroll to the desired value (in this example, a DMX value of 255).
3. Press <Enter> to store the selection.

Set an MSpeed Value (MSPD)

1. Scroll to the *MSPD* parameter. Press <Enter> to select.

2. Scroll to the desired MSpeed (in this example, *1.5*) in decimal seconds.
3. Press <Enter> to store the selection.

Note: ***In this example, the MSpeed value only affects the pan and tilt parameters, because the pan and tilt values default to MSpeed time, and no other parameters with MSpeed values were chosen.***

Choose a Macro (MACR)

1. Scroll to the *MACR* parameter. Press <Enter> to select.

2. Scroll to the desired macro value (in this example, *MCOF*).
3. Press <Enter> to store the selection.

Set a Crossfade Value (XFAD)

1. Scroll to the *xFAd* parameter. Press <Enter> to select.

2. Scroll to the desired crossfade value in increments of 0.1 or 1 (in this example, *x 1.5*).
3. Press <Enter> to store the selection.

Note: ***The crossfade value will affect the DIM and ZOOM parameters. Set the unit of time used for crossfade (seconds, minutes, or hours) using the TIME parameter. Cyan, Magenta and Yellow are crossfaded in continuous and pure mix modes that do not use MSpeed.***

Set a Delay Value (DLAY)

1. Scroll to the *dLAY* parameter. Press <Enter> to select.

2. Scroll to the desired delay value in increments of 0.1 or 1 (in this example, *d 6.0*).
3. Press <Enter> to store the selection.

Note: ***The delay value determines the length of the scene. If you want all motor transitions to be completed before the next scene begins, XFAD or MSPD must be less than or equal to DLAY. If XFAD or MSPD is longer than DLAY, the motor movement will not be completed before the next scene begins, which could produce undesirable results - such as no light output during the scene.***

Set the unit of time used for delay (seconds, minutes, or hours) using the TIME parameter.

Set the Time Unit (TIME)

1. Scroll to the *TIME* parameter. Press <Enter> to select.

2. Scroll to the desired time value (in this example, *SEC*).
3. Press <Enter> to store the selection.

Note: This parameter sets the unit of time used in for the XFAD and DLAY values.

Erase the Scene (ZERO)

1. Scroll to the *ZERO* parameter.

2. Press <Enter> to select. The LED will display *OK?*
3. In this example, press the <Menu> button. Pressing the <Menu> button will exit this parameter and leave the current scene as programmed. Pressing the <Enter> button will erase the current scene and mark the end of a loop.

Creating a Loop

A loop is a series of programmed scenes that continuously plays in sequential order. To create a loop, you must first create two or more contiguous scenes (see *Step-by-Step Scene Creation* on page 42). After you have created your scenes, go to the *next available* scene and choose the ZERO menu option to erase any programmed parameter values and mark the end of the loop.

Note: If you program all available on-board scenes, you do not have to mark the end of the loop. When preset playback is set on, the fixture will automatically loop after playback of all programmed scenes.

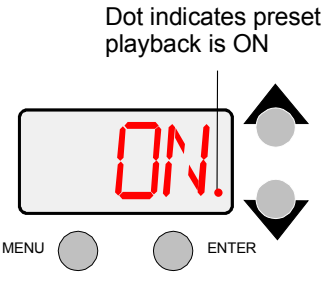
Playing Back a Loop

To play back a loop, you must set preset playback on for each fixture (see *Setting Preset Playback (PLAY)* on page 21). When preset playback is set on, your fixture will automatically begin playing back the first scene and continue through the loop.

Note: Scene 1 must be programmed to enable preset playback.

The fixture has two ways to indicate that preset playback is on. First, the display will show a dot in the lower right corner. Second, during normal operation, the seven-segment LED cycled information will be changed to display PRST instead of the fixture's software version (Vxxx).

If power is removed during playback, the fixture will home and begin playback at the first scene. To stop playback, manually set playback mode off, (see *Setting Preset Playback (PLAY)* on page 21).



Preset playback indicator.

Synchronizing Preset Playback

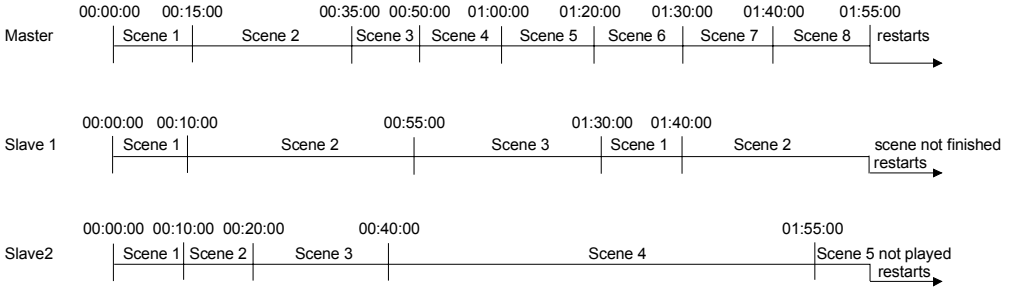
After creating one or more scenes for your fixtures, you can synchronize the preset playback for all Studio Command™, Studio Command®, x.Spot®, Studio Spot™ 250, Studio Color® 250, Studio Color® 575, Studio Spot™ 575, EC-1™, ES-1™, Technobeam®, Color Pro® HX, HXi, or FX fixtures in the link.

Note: ***Synchronizing preset playback is applicable for fixtures operating in stand-alone mode only. Do not include a DMX console in the link while synchronizing preset scene playback.***

Synchronizing playback allows you to set all applicable fixtures to a master clock so that all fixtures have a definite, synchronized starting point when playing back their sequences (or loops). It is the master fixture (the fixture assigned DMX start channel 1) which determines the sequence length for *all* the other fixtures in the link (slave fixtures), regardless of the number of programmed scenes or the sequence length of the individual slave fixtures.

When the master fixture reaches the end of its last scene, *all* fixtures will restart at scene 1 (regardless of whether the slave fixtures have finished playing their scenes) and *all* the clocks will be reset to zero.

For example, if a slave fixture has a shorter sequence length, it will continuously repeat its sequence until the master fixture resets all the clocks. If a slave fixture has a longer sequence length, it will restart at scene 1 before it completes its entire sequence.



Example of synchronized playback.

To enable synchronized playback:

1. Link the fixtures you want to synchronize (see *Standalone Fixture Linking* on page 14). Make sure you terminate *both* the first and the last fixtures in the link and that there are no DMX consoles on the link.
2. Assign one fixture as the master fixture by assigning it a unique DMX start channel 1 or fixture number 1 (see *Assigning a DMX Start Channel* on page 15). Make sure *no other fixture* on the link is assigned DMX start channel 1 or fixture number 1.
3. Set preset playback on for all fixtures on the link (see *Setting Preset Playback (PLAY)* on page 21).

Chapter 4:

Fixture Programming

Programming control features for Studio Command™ fixtures include:

- Assigning a DMX start channel
- Accessing and setting fixture options
- Viewing fixture status
- Crossloading software
- Performing self tests
- DMX Programming for creating, storing, and playing scenes

The Onboard Menu System controls all these features via the LED display. A DMX console can provide remote DMX programming to all fixtures on a link and, if it is running TalkBack protocol, remote control of other fixture operations listed above.

For more information on the Studio Command Menu System, see *Chapter 3: The Menu System* and *Appendix D: Menu Map*.

TalkBack™ Support for Remote Access

All Studio Command fixtures support TalkBack" technology. TalkBack™ technology allows remote access to the menu system built into High End Systems fixtures. A DMX console supporting TalkBack can remotely access any option in the Studio Command onboard menu system.

TalkBack protocol uses the normal DMX-512 connection for bi-directional communication with the fixture so physical access to the fixture is no longer required to perform operations like changing a DMX address or configuring preset programs. TalkBack protocol utilizes the primary DMX link (pins 2-3) in a half-duplex communication mode. This means that it does not require pins 4-5 to be connected or used to receive TalkBack messages coming from the fixture.

TalkBack protocol uses a discovery process to find the unique number that is embedded inside each fixture, similar to a serial number. Once the fixtures have all been identified, the current fixture parameter settings and information can be accessed. Fixture access can happen at anytime, but the Talkback messages are only valid after the fixture starts homing.

DMX Programming Overview

A Parameter (parameter) is a fixture attribute that can be controlled to modify the light beam in terms of color, beam quality and pattern, intensity, or focus (position). DMX programming assigns a DMX value to each of the fixture's parameters. A scene (sometimes referred to a *look* or a *cue*) is one combination of parameter settings. These scenes are the building blocks for show creation.

Full Speed verses MSpeed Control

Some parameters can be set to operate at full speed or MSpeed (motor speed). Full speed operations are completed in the shortest length of time after the motor starts moving. With MSpeed control, change occurs smoothly over the entire MSpeed time value selected. For example, if you select an MSpeed time of 30 seconds, the motor will gradually change position until it reaches its new destination at the end of 30 seconds.

DMX Programming Options

Studio Command fixtures can be programmed to create and play back scenes with either a DMX-compatible controller or with Onboard Menu System Preset programming (for stand-alone operation). However, you cannot use both a DMX compatible controller and the fixture's on-board menu system at the same time. In other words, you cannot create a scene using the on-board memory and play it back using a controller. You also cannot use a controller at the same time on-board scenes are playing.

Using a DMX controller, you can program an unlimited number of sequences (combinations of scenes) and retain direct control over the Studio Command fixture at all times. You may choose to save time by programming your fixtures using a controller and then capturing the scene(s) to the on-board memory of multiple Studio Command fixtures.

If you plan to operate your fixtures without a DMX controller, you can utilize one of the fixtures on the link to synchronize preset playback among all fixtures of that type connected to the DMX link.

Note: Because controllers cannot transmit crossfade or delay parameter values, you must use preset programming in the onboard menu system to manually set those parameter values at the fixture.

Programming with a DMX Console

The Wholehog III® Lighting Console, and the Hog iPC console are available from High End Systems to control Studio Command fixtures (see *Related Products and Accessories* on page 3). For more information on whether your DMX controller supports Studio Command fixtures, contact the controller's vendor. For more information on operating your fixture with a controller (or control device such as DMX control software), consult the documentation provided with the controller.

DMX Programming Using the Onboard Menu System

Fixture level DMX programming is executed in the Preset portion of fixture's Onboard Menu system, see *Preset Menu (PRST)* on page 21. For more detailed information on all the settings you can control in Studio Command fixtures using the onboard Menu System, see *Chapter 3: The Menu System* and *Appendix D: Menu Map*.

Parameter Function Descriptions

The following sections describe the Parameters for Studio Command fixtures running Standard or Flat DMX Protocol. All DMX values indicated in the detailed parameter descriptions are in decimal units. See *Appendix A: Studio Command™ DMX Protocol* for complete DMX tables.

Pan and Tilt Parameters

The **Pan** and **Tilt** parameters control the Studio Command fixture's 540° pan range and 240° tilt range. Pan and Tilt functions each utilize two channels to provide 16 bit adjustment to a fraction of a degree.

Pan and Tilt motion for Studio Command fixtures is controlled with MSpeed values by default, (see *MSpeed (Motor Speed) Parameter* on page 53). If you choose to control the Pan and Tilt parameters with DMX controller crossfading, set Pan/Tilt MSpeed off in the Control parameter (see the DMX tables in *Appendix A: Studio Command™ DMX Protocol*).

Note: Optical encoders for pan and tilt correct the fixture's position if the fixture is jarred from its programmed position. If a physical obstruction prevents the fixture from correcting its position, the fixture "times out" to prevent wear on the motors. If your fixture has timed out, remove the obstruction and home the fixture to return it to normal operation.

Color Function Parameter

The **Color Function** parameter determines color selection options. The Color Function mode can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor). For more information on MSpeed, see *MSpeed (Motor Speed) Parameter* on page 53.

The Color Function you choose will effect which parameter values are available for each individual color (Cyan, Magenta, and Yellow). The following table describes the Color Functions available on the Studio Command fixture.

Color Function	Description
Continuous	Allows exact positioning at any point on the color wheel for a smaller *step* between color wheel positions for color crossfades.
Random	Selects whole color positions at variable speeds. Random speed is set by the Cyan channel.
Cycle	Cycles through colors. Cycle speed is set by the Cyan channel.

Cyan, Magenta, and Yellow Parameters

Cyan, **Magenta** and **Yellow** parameters determine color mixing options. The color options available are determined by the Color Function parameter DMX value you choose.

Standard Protocol has an additional audio color modulation function that can be accessed when the **Control** parameter is set in 170–197 DMX value range, (see *Control Parameter* on page 54).

Audio modulation is based on the amplitude of the sound, not the beat. When audio color modulation is selected, the color channels that are not selected for color modulation default to Pure Mix mode. The following table describes the settings available for the color channels.

Audio Function	Modulation Type and Description
Saturated color to white	Full movement. Maximum amplitude music causes full scale movement. The selected color channel controls the decay rate of slow, medium and fast.
White to saturated color	
Saturated color to white	Limited movement. Cyan channel sets the maximum travel position. Decay rate is medium for all settings
White to saturated color	
More to less saturated color	Middle out. Limited movement. The center of the mix media is the center of the modulation. Cyan setting controls modulation size. Decay rate is medium.
Less to more saturated color	

Zoom Parameter

The **Zoom** parameter is controls the Zoom range from 18° at a DMX value of 0 to 33° at a DMX value of 255.

Shutter Function Parameter

Basic **Shutter** functions can be selected when no lamp or dimming functions are set in the **Control** channel. The Control channel also qualifies the Shutter parameter to create lamp boost, lightning and strobing effects.

Shutter Function	Description
Close	Closes shutter
Periodic Strobe	Strobes beam at specified intervals
Random Strobe	Allows all Studio Command Fixtures on the DMX link to strobe their shutters at random times.
Random/Synchronous Strobe	Allows all Studio Command Fixtures on the DMX link to strobe their shutters at random times in unison.
Ramp Open/Snap Shut	Opens shutter at variable speeds, then snaps shut at full speed
Snap Open/Ramp Shut	Opens shutter at full speed, then ramps shut
Ramp Open/Ramp Shut	Opens shutter at variable speeds, then ramps shut
Random Ramp Open/Snap Shut	Opens shutter at random variable speeds, then snaps shut at full speed
Random Snap Open/ Ramp Shut	Opens shutter at full speed, then ramps shut at random variable speeds
Open	Opens shutter

Control Channel Setting	Shutter Function	Description
Values 134-137 Lamp Assisted Strobes	Close	Shutter functions are the same as normal Shutter functions. Periodic and random random and random synchronous strobe functions are lamp assisted. Ramping functions are not lamp assisted.
	Periodic Strobe	
	Random/Random Strobe	
	Random/Synchronous Strobe	
	Ramp Open/Snap Shut	
	Snap Open/Ramp Shut	
	Ramp Open/Ramp Shut	
	Random Ramp/Snap	
	Random Snap/Ramp	
	Open	
Values 138-141 Lamp Functions	Close	The Boost effect boosts the Lamp above the 700 Watt level for the specified period of time. The lamp is also boosted during the Lightning effects. Before another Boost or Lightning effect can occur, the Shutter channel must be moved to either closed or open, or the Lamp Control channel must be moved outside the Lamp Function range. Boost effects to black boost the lamp for a specified time then close the shutter. Boost effects to white boost the lamp for a specified time, then leave the shutter open with the lamp dimmed. When a Lightning effect is selected, the Dim channel scales the overall brightness of the lightning stroke.
	Periodic lamp strobes	
	Random/random lamp strobes	
	Synchronous/random lamp strobes	
	Boost lamp, black. Six time ranges from 1–.25 second	
	Boost lamp, white. Six time ranges from 1–.25 second	
	Lightning strike	
	Open	
Values 146-149 Lamp Dimming	Closed	Shutter functions are same as normal shutter function range. Dimming is accomplished electronically, lowering the lamp power. Dimming will not go to black. Strobes are mechanical and will go to black.
	Open	

Dim Parameter

The Dim parameter provides full dimming capability without changing the color temperature or the beam shape. The dim values range from closed (DMX value of 0) to fully open (DMX value of 255).

Audio Modulation is available for the Dim parameter when the Control channel value is set from 206–209.

MSpeed (Motor Speed) Parameter

The **MSpeed** parameter controls the time required for a motor to complete movement when changing from one position to another. MSpeed provides a means for all motors to reach their target position at the same time, even though each motor may have different distances to travel. MSpeed movement is extremely smooth because the fixture controls its own movements and is not dependent on DMX refresh rates.

MSpeed times vary from 0.15 seconds to 252.7 seconds. However, if you apply MSpeed to a parameter, be sure that the delay value (length of time allowed for the entire scene) is longer than the MSpeed value to allow the motors to complete their movement before the end of the cue. An MSpeed value that is longer than the delay value could produce an undesirable result; for example, no light output during the scene. For a listing of exact MSpeed times, see *Appendix B: MSpeed Conversion Table*.

By default, MSpeed is applied to Pan and Tilt positioning. However, you can disable MSpeed for pan and tilt with the Control parameter. You can also apply MSpeed times to the Color Function settings, see *Color Function Parameter* on page 51.

Macro Parameter

The Macro parameter controls Internal Effects™ macros. These are factory-programmed sequences that allow you to quickly program complicated looks in one scene (cue). Each Internal Effect™ macro modifies a specific set of parameters, while allowing user control of all other parameters in the scene. The amplitude of the position macro movement is determined by the Pan Coarse channel and Tilt Coarse channel, respectively. The MSpeed channel controls the speed of the macros.

With the MSpeed set at the default value of DMX 0-4, an Internal Effects macro completes its movement in approximately 2.5 seconds. This provides a pleasing look when the additional variation given by using the MSpeed channel is not required. With the MSpeed set between DMX 5-255, Internal Effects macros complete movement at the selected MSpeed time (up to 25 seconds).

Those fixture types that support On Board Programming also support the Internal Effects macros as part of the On Board programming features. The Internal Effects macros operate as an additional programming parameter labeled MACR.

The four Internal Effect available on a standard configuration Studio Command fixture are Pan Sweep, Tilt Sweep, Clockwise Circle and Counterclockwise Circle.

Control Parameter

The Control parameter activates certain Fixture, Shutter, Lamp and Audio modulation functions on other Channels. To access all control settings in Standard Protocol (except for Pan & Tilt MSpeed Off), first select a control channel value, then set the Shutter channel to "0."

Control parameter settings available in Flat protocol.

Control Setting	Description	Notes
Safe	Disables all Control settings for normal operation. The Control channel should not be crossfaded.	
Pan & Tilt MSpeed Off	Sets Pan & Tilt MSpeed to off. The Control channel should not be crossfaded.	Command is sent instantaneously

Control Setting	Description	Notes
Display Off	Sets display to off.	Commands must be sent for 20 consecutive DMX packets. For example, if the controller sends 16 packets per second, send the value for 1.25 seconds.
Display Dim	Dims display characters.	
Display Bright	Brightens the display characters.	
Home	Remotely homes the fixture.	
Lamp On	Remotely restrikes the fixture's lamp.	
Lamp Off	Remotely extinguishes the fixture's lamp.	
Lock	Returns all fixtures to a "known" position (128° tilt and either 90° or 450° pan). This option is used when you are ready to shut down the fixtures and pack them for transport.	Commands must be sent for 80 consecutive DMX packets. For example, if the controller sends 16 packets per second, send the value for 5 seconds.
Shutdown	Remotely deactivates the fixture. When a fixture is shut down, the lamp is extinguished, power to the motors is disabled, and the LED display reads "SHUT DOWN". If a fixture is in shutdown mode, you must home the fixture to bring it back into operation.	
Lamp Assisted Strobes	Periodic and Random strobe functions are lamp assisted. Ramp functions are not lamp assisted.	The shutter does not have to be set to 0 for Lamp functions
Lamp functions	Modifies the shutter channel	
Lamp/mechanical dimming	Lamp output will vary from a minimum to 700 Watts as the mechanical dimming ranges from 0–100%	
Lamp only dimming	Electronic dimming only from a minimum to 700 Watts.	
Cyan modulation	Allows audio modulation of the Cyan color wheel.	Audio Modulation is based on amplitude, not beat. Audio Modulation commands are set instantaneously and there is no shutter requirement
Magenta modulation	Allows audio modulation of the Magenta color wheel.	
Yellow modulation	Allows audio modulation of the Yellow color wheel.	
Cyan & Magenta modulation	Allows audio modulation of the Cyan and Magenta color wheels.	
Cyan & Yellow modulation	Allows audio modulation of the Cyan and Yellow color wheels.	
Magenta & Yellow modulation	Allows audio modulation of the Yellow and Magenta color wheels.	
Modulate all colors	Allows audio modulation of all three color wheels.	
Dim modulation	Allows audio modulation of mechanical dimming.	
Lamp and Dim modulation	Allows audio modulation of mechanical and electronic dimming.	
Lamp modulation	Allows audio modulation for electronic dimming with short medium and long sustain rates.	

Chapter 5:

General Maintenance

This chapter includes information on replacing parts, optimizing the lamp, cleaning the fixture, and updating fixture software. Please note the warnings under each heading before servicing your fixture.

Warning: This fixture must be serviced by qualified personnel. The information listed in this chapter is intended to assist qualified personnel *only*.

Replacing Parts

Warnings:Disconnect power before servicing.

Replace fuses with the specified type and rating only.

Equipment surfaces may reach temperatures up to 160° C (320° F). Allow the fixture to cool before handling.

Replacing Fuses

There are two fuses located on the logic board, two fuses located on the filter board, and two fuses located on the motor power supply board.

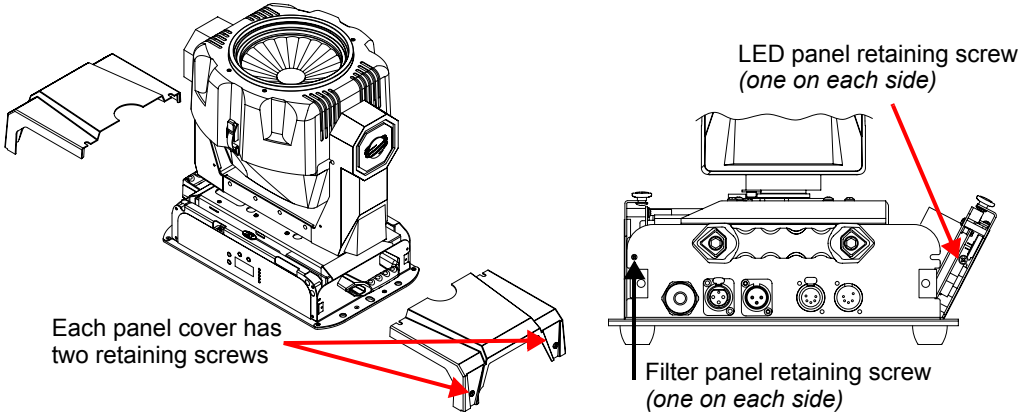
To replace the fuses:

1. Disconnect power to the fixture. If the fixture has been operating, allow the fixture to cool before handling.
2. Determine which fuse to replace by referring to the following table.

Fuse	Type and Rating	Size	Protects	Symptom of Failure
Logic Board F1	2.5 A, 250 V, Slow Blow only	5mm x 20mm	Pan motor and Tilt motor	Pan and Tilt will no longer function.
Logic Board F2	2.5 A, 250 V, Slow Blow only	5mm x 20mm	Other motors and fans	Wheels will no longer function, and fans will shut off.
Motor Power Supply Board F1	6.3 A, 250 V, Slow Blow only	5mm x 20mm	Motor Power Supply Board	Motors will not move, lamp is off, and fixture appears dead.
Motor Power Supply Board F2	6.3 A, 250 V, Fast Blow only	5mm x 20mm	Logic Board and motors	Motors will not move, lamp is off, and fixture appears dead.

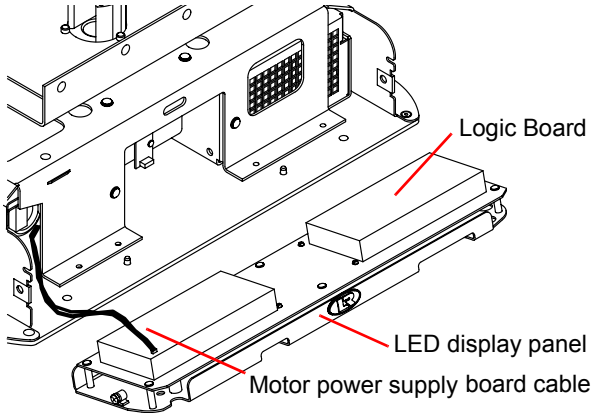
Fuse	Type and Rating	Size	Protects	Symptom of Failure
Filter Board F1	16 A, 250 V, Fast Blow only	5mm x 20mm	Entire fixture	Motors will not move, lamp is off, and fixture appears dead.
Filter Board F2	16 A, 250 V, Fast Blow only	5mm x 20mm	Entire fixture	Motors will not move, lamp is off, and fixture appears dead.

3. Using a wide-tip, flat head screwdriver, loosen the two panel cover retaining screws on each side of the fixture.
4. Remove the fixture's two panel covers by sliding them off the fixture.

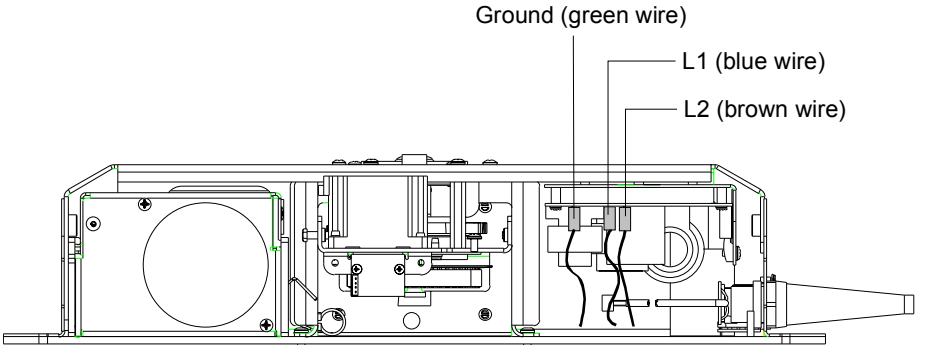

LED panel retaining screw
(one on each side)
Each panel cover has two retaining screws
Filter panel retaining screw
(one on each side)

5. To access the **logic board fuses** or **the motor power supply board fuses**, use a #2 Phillips-head screwdriver to loosen (*but do not remove*) the two retaining screws on either side of the LED display panel.

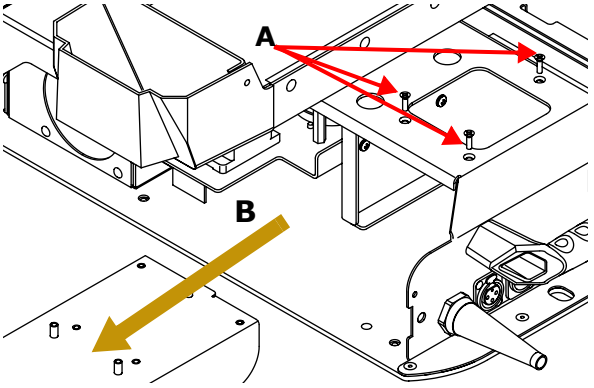
   If you want to access the **filter board fuses**, use a #2 Phillips-head screwdriver to loosen (*but do not remove*) the two filter panel retaining screws.
6. Gently lower the desired panel(s).
7. From the LED display panel side of the fixture, disconnect the motor power supply cable from the logic board.



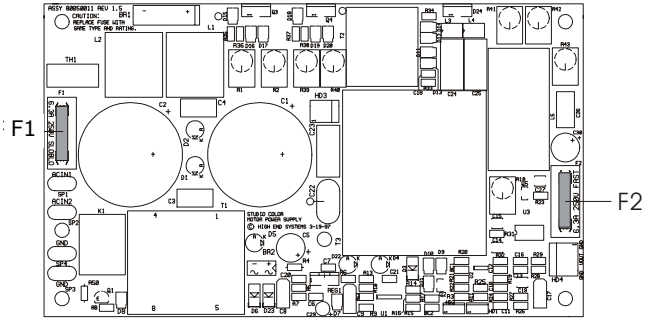
8. From the filter panel side of the fixture, Disconnect the Ground (green wire), L1 (blue wire), and L2 (brown wire) from the motor power supply board.



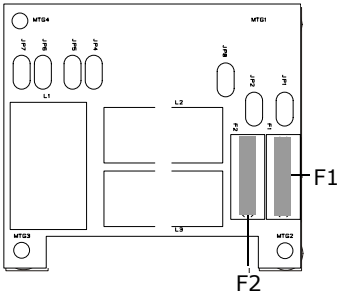
9. Use a #2 Phillips-head screwdriver to remove the three screws **(A)** and slide the motor power supply board assembly **(B)** out of the fixture.
10. Locate the fuse(s) to be replaced and replace with a fuse of the same type and rating.



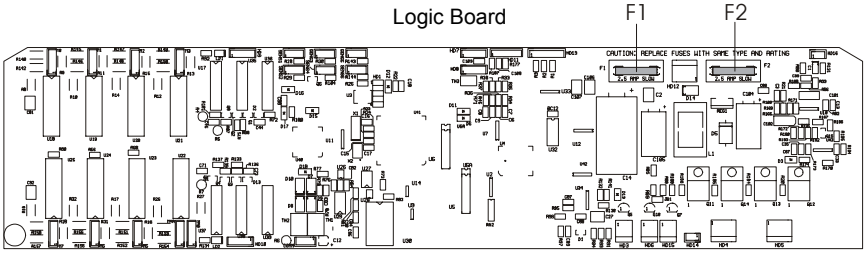
Motor Power Supply Board



Filter Board



Logic Board



Note: ***If you are replacing the fuses on the LED display panel or the filter panel, you must first remove the protective plastic covering over the fuse(s).***

If applicable, reinstall the protective plastic covering over the fuse.

11. If you removed the motor power supply board assembly, replace the assembly in the fixture and reinstall the three screws.
12. Reconnect the Ground, L1, and L2 wires to the motor power supply board.
13. Reconnect the motor power supply cable to the logic board.
14. Return the filter panel and/or the LED display panel to the original, upright position and tighten the display panel retaining screws.
15. Replace the two panel covers and tighten the four panel cover retaining screws.

Replacing the Lamp

Warnings:Disconnect power before re-lamping or servicing.

An operating, unshielded MSR lamp emits ultraviolet and visible (UV-vis) radiation which could damage eyes and skin. Whenever you are working on or near an exposed lamp, wear protective eye gear. Never look directly at the lamp while the lamp is on.

Hot lamp may be an explosion hazard. Do not open for five minutes after switching off. Wear eye and hand protection when re-lamping.

Equipment surfaces may reach temperatures up to 160° C (320° F). Allow the fixture to cool before handling.

Caution: This equipment is designed for use with a Philips® MSR 700-watt lamp only. Use of any other type lamp may be hazardous and may void the warranty.

You will need:

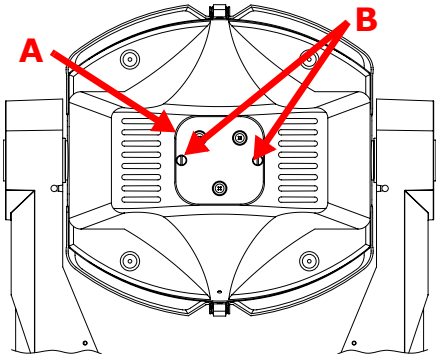
- Philips® MSR 700-watt lamp
- protective gloves and eyewear
- wide tip, flat head screwdriver

To Replace the lamp:

1. Disconnect power to fixture.

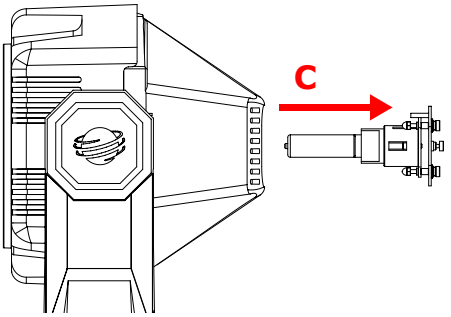
   If the fixture has been operating, wait for the lamp to cool before handling.

2. Put on protective eyewear and gloves.

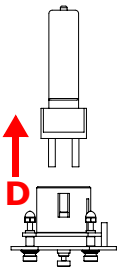


Lamp cap and assembly screws.

3. Tilt the fixture's head to access the lamp cap **[A]** and using a wide tip, flat head screwdriver, loosen (*but do not remove*) the two lamp assembly screws **[B]**.
4. Pull the lamp assembly straight out of the fixture **[C]**. The lamp assembly is connected to the fixture by lamp socket wires. Support the lamp assembly while replacing the lamp. ***Do not allow the lamp socket wires to support the weight of the lamp assembly.***



5. Holding the existing lamp by its ceramic base, carefully pull the lamp straight out of the lamp socket **[D]**.



Caution: Do not squeeze the lamp glass while removing the existing lamp from the socket. Lamp glass may shatter.

6. Remove all packaging materials from the new lamp. Holding the new lamp by its ceramic base, gently press the two base pins into the lamp socket until the lamp is firmly seated.

Caution: When handling the new lamp, avoid contact with the lamp glass. If the lamp glass is soiled by oil or dirt from skin, gloves, etc., clean the cold lamp glass with an alcohol wipe. A soiled lamp could overheat and burst, causing damage to the fixture.

7. Re-insert the lamp assembly straight into the fixture.

Caution: Make sure the lamp socket wires are not wrapped around the lamp or crimped while reinserting the lamp assembly.

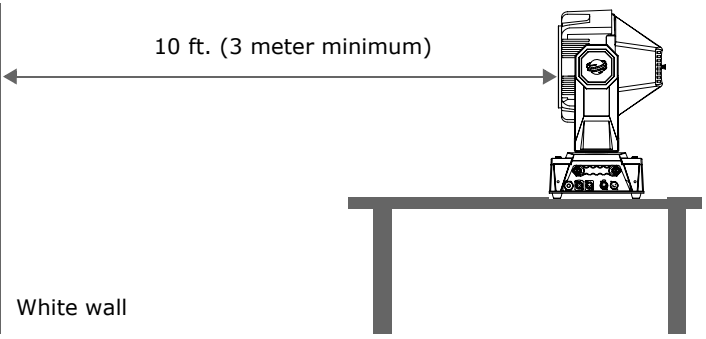
8. Tighten the lamp assembly screws.
9. Reset the lamp hours to zero so that you can track the lamp life (see *Resetting Lamp Hours (L/RS)* on page 40).
10. Optimize the new lamp.

Optimizing the Lamp

You should optimize the lamp after you replace the lamp, or if you notice a "hot spot" of brightness anywhere other than the center of the light beam.

To complete the optimization procedure below, you can use either the fixture's on-board menu system or your DMX controller.

1. Orient the fixture so that the beam will project onto a flat, white surface at least 10 feet (3 m) away.
2. Turn the lamp on using the Menu system (see *Turning the Lamp On or Off (LAMP)* on page 33) or with a console via DMX.



3. Make sure that the light beam is round and not oval.
4. If necessary, use the following steps in the menu to adjust the pan and tilt construct values until the beam is round, or set Pan and Tilt values via a DMX console.

AddR	Press and hold <Menu> until AddR appears on the LED display.
PRST	Scroll to the *PRST* menu. Press <Enter> to select.
EdIT	Scroll to the *EDIT* menu. Press <Enter> to select.
SN01	Scroll to a scene number (*SN01–SN16*).
to	
SN16	Press <Enter> to store.

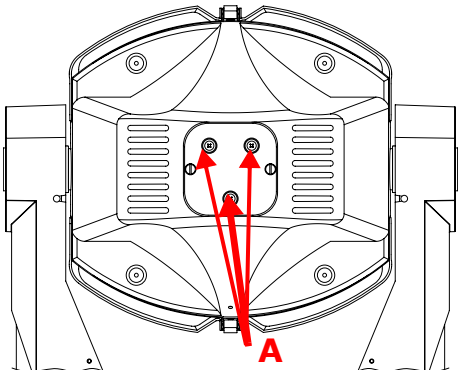
Select a Pan Value (PAN):

PAN	Scroll to the *PAN* parameter. Press <Enter> to select.
+30.5	Scroll to a pan value from -49.9 to +49.9 (in this example, *+30.5*). Press <Enter> to store the selection.

Select a Tilt Value (TILT):

TILT	Scroll to the *TILT* parameter. Press <Enter> to select.
-20.3	Scroll to the desired tilt value from -49.9–+49.9 (in this example, *-20.3*) Press <Enter> to store the selection.

5. Locate and loosen the three lamp optimization screws **[A]**.
6. Look at the wall where the beam is projected and use the three optimization screws to adjust the lamp's position within the fixture. until the beam is at its maximum brightness and the light level is even across the beam (or the "hot spot" of brightness is at the center of the beam).



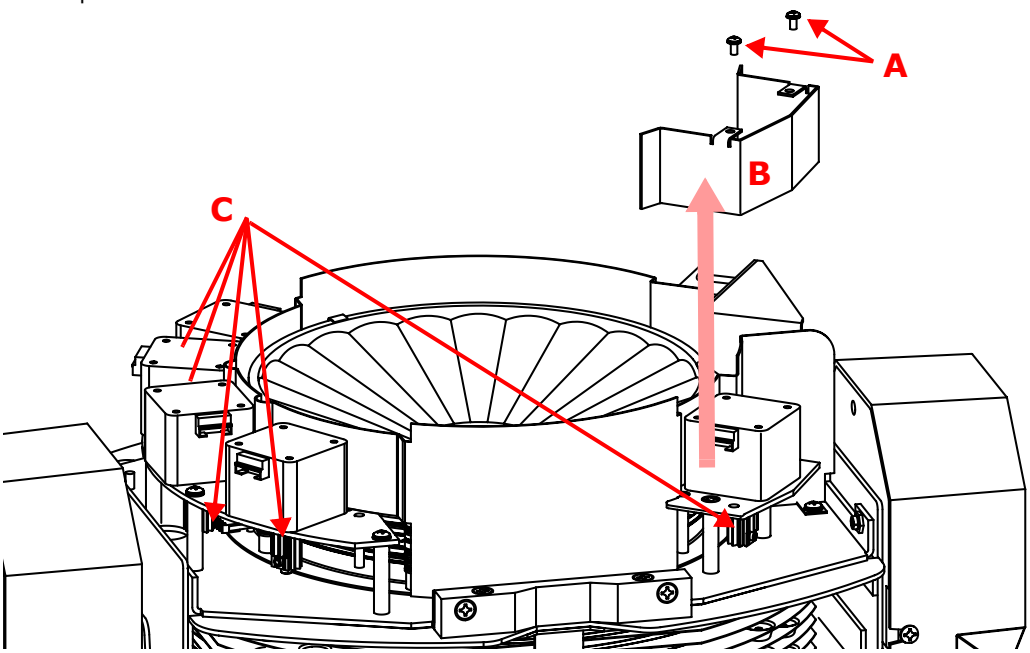
Motor Gear Maintenance

Lubricating the motor gears with each lamp replacement will significantly extend gear life. Referring to the figure below:

1. Unlatch and remove bezel.
2. Remove 2 screws **[A]** and lift the Dim/Shutter motor light shield **[B].**
3. Tilt the module to access the gear for each motor **[C]** and, supporting the gear, carefully apply Krytox lubricant.

Caution: Using too much force in applying lubricant can bend and damage gear.

4. Replace shield and bezel.



Chapter 6:

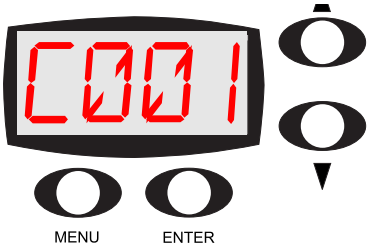
Troubleshooting

This chapter lists typical symptoms and solutions for problems you might experience when using your Studio Command™ fixture. If the problem you are experiencing is not listed in this chapter or the solution listed does not solve the problem, contact High End Systems customer service:

Customer Service

High End Systems, Inc.
2105 Gracy Farms Lane
Austin, TX 78758 USA
voice:800.890.8989
fax: 512.834.9195
toll free: 800.890.8989

Alphanumeric Display Error Messages



The front panel on Studio Command fixtures has an alphanumeric LED (Light Emitting Diode) display, five status LEDs, and four menu navigation buttons.

Under normal circumstances, the alphanumeric display cycles between displaying the fixture's name (CMNd), the fixture software version (*Vxxx*), and the fixture's DMX start channel (*Cxxx*) However, if you are experiencing problems with your fixture, the status LEDs and/or alphanumeric display can also provide insight on where the problem is originating.

The following table lists alphabetically the Error Messages Studio Command fixtures can display along with the problem(s) each may indicate and potential solutions.

Display Message	Problem	Solution
BOOT DIFF	The fixture's normal boot code does not match the backup boot code.	Update the boot code (see *Copying the Boot Code (BOOT)* on page 33).
EMEM ADIO	The fixture lost the audio gain setting and defaults to a setting of 6.	To restore setting, see *Setting the Audio Gain (GAIN)* on page 29. Contact High End Systems customer support if problem continues.

Display Message	Problem	Solution
EMEM ALED	The fixture lost the audio LED setting and will default to off	To restore setting, see *Enabling Audio Modulation (ALED)* on page 28. Contact High End Systems customer support if problem continues.
EMEM CHNL	The fixture lost the assigned DMX start channel and will automatically default to DMX start channel 1.	To reassign the DMX start channel, see *Assigning a DMX Start Channel* on page 15.
EMEM DINV	The fixture lost the display invert setting and will default to non-inverted	To restore display invert setting, see *Inverting LED Characters (D/IN)* on page 26.
EMEM DLOS	The fixture lost the DMX data loss setting and will default to short mode.	To reassign the DMX data loss setting, see *Data Loss Shutter Close (DLOS)* on page 27).
EMEM DPLY	The fixture lost the display setting and will default to on and bright.	To restore the display setting, see *Changing the Display Output (DSPL)* on page 26.
EMEM FHRS	The fixture lost the number of fixture hours and will default to zero.	Not Applicable.
EMEM FMOD	The fixture lost the fast pan and tilt mode setting and will default to normal pan and tilt mode.	To reassign the pan and tilt mode setting, see *Increasing the Pan/Tilt Movement (FAST)* on page 28.
EMEM LHRS	The fixture lost the number of lamp hours and will default to zero.	Not Applicable.
EMEM LMPL	The fixture lost the lamp life limitation setting and will default to unlimited lamp life.	If the fixture was set to lamp life limitation, reassign the lamp life setting (see *Setting the Lamp Warning Message (LMPL)* on page 27).
EMEM L/ST	The fixture lost the number of lamp strikes and will default to zero.	Not Applicable.
EMEM MODE	The fixture lost the mode setting (DMX control or preset playback) and will default to DMX control.	To reassign the mode setting, see *Setting Preset Playback (PLAY)* on page 21.
EMEM PINV	The fixture lost the pan invert setting and will default to non-inverted.	To reassign the pan invert setting, see *Inverting Pan (P/IN)* on page 25.
EMEM SWAP	The fixture lost the pan/tilt swap setting and will default to non-swapped.	To enable pan/tilt swap (see *Swapping Pan and Tilt (SWAP)* on page 24).
EMEM TINV	The fixture lost the tilt invert setting and will default to non-inverted.	To reassign tilt invert setting (see *Inverting Tilt (T/IN)* on page 25).
EMEM TMOD	The fixture lost the test mode setting (*Factory Use Only*) and defaults to normal operation.	Not Applicable.

Display Message	Problem	Solution
EMEM USER	The fixture lost the assigned user setting and will automatically default to user A.	To reassign the user setting (see *Setting the User Type (USER)* on page 30).
ERSE FLSH	One or more fixtures on the data link has failed to erase the FlashROM in a suitable amount of time.	Attempt another software crossload (see *Crossloading Fixture Software (XLD)* on page 32). Contact High End Systems customer support if problem continues.
HEAD TEMP	Fixture head temperature has exceeded the maximum permissible level due to: a bad fan excessive ambient temperatures blockage in fan vents on back of the fixture head a broken wire connecting the fan to the logic board. The fixture automatically turns the lamp and motors off.	Reduce the ambient temperature around the fixture and/or remove any blockage from the fixture's fan vents. Contact High End Systems customer support (see *page ii*) if problem continues.
LAMP LIFE	The fixture's lamp life limitation setting was enabled and the current lamp has exceeded 900 hours.	This message is only a warning. Take no action unless this message changes to "LAMP OUT."
LAMP MISS	The fixture cannot detect the temperature readback from the thermometer in the fixture head. The lamp cap is not installed on the fixture. There is a broken wire or loose connector between the thermometer and the logic board. The lamp interlock in the head has failed.	Make sure lamp cap is installed on the fixture (see *Replacing the Lamp* on page 60). The lamp will not strike if the lamp plate is removed. If the lamp is on when the lamp plate is removed, the lamp is extinguished. If the lamp was on when the lamp plate was removed, the lamp strikes again 30 seconds after the lamp plate is reinstalled. Contact High End Systems customer support if problem continues.
LAMP OUT	The fixture's lamp life limitation setting was enabled and the current lamp has exceeded 1000 hours. The fixture can no longer strike the lamp.	Replace the lamp (see *Replacing the Lamp* on page 60) and reset the lamp hours (see *Resetting Lamp Hours (L/RS)* on page 40).
LAMP STAT	Because of an unexpected electrical event, the fixture cannot determine the current status of the lamp.	Home the fixture (see *Homing the Fixture (HOME)* on page 33). Contact High End Systems customer support if problem continues.

Display Message	Problem	Solution
LAMP TOUT	The fixture has unsuccessfully attempted to strike the lamp.	Allow the fixture to cool, then attempt to manually strike the lamp (see *Turning the Lamp On or Off (LAMP)* on page 33). Replace the lamp (see *Replacing the Lamp* on page 60). Contact High End Systems customer support problem continues.
LINK BUSY	Two fixtures on the same like are both attempting to transmit data during preset playback or software crossloads.	Disconnect any controllers, bypass any serial data distributors and/or data line optoisolators, and bypass or make sure that any fixtures using RS-422 communications (such as Dataflash® AF1000 xenon strobes and Intellabeam® fixtures) are located *after* the Studio Command fixtures on the link. These devices block communication with any other Studio Command fixtures on the link.
LINK EMTY	The fixture is attempting to crossload software but cannot find any suitable fixtures on the data link.	Make sure that all data cables are functioning and that all receiving fixtures are connected to the data cable and powered on. Contact High End Systems customer support if problem continues.
PAN ENCD	The fixture has detected a pan error and cannot correct its position due to a: physical obstruction broken belt bad pan encoder bad encoder wheel broken wire connecting the encoder to the logic board	Remove the object (externally or internally) that is blocking the fixture's pan movement and home the fixture (see *Homing the Fixture (HOME)* on page 33). Contact High End Systems customer support if problem continues.
PAN SENS	The fixture cannot find the pan home slot due to a possible: broken belt faulty motor faulty motor driver broken wire connecting the sensor or pan motor to the logic board bad sensor	Contact High End Systems customer support.

Display Message	Problem	Solution
PCB TEMP	The temperature in the top box has exceeded the maximum permissible level due to a possible: bad fan excessive ambient temperatures blockage in the fan vents broken wire connecting the fan to the logic board. The fixture will automatically turn the lamp and motors off.	Reduce the ambient temperature around the fixture and/or remove any blockage from the fixture's fan vents. Contact High End Systems customer support if problem continues.
PRST LOST	The fixture failed to read preset data from non-volatile memory.	Reassign the preset scenes' construct values (see *Editing or Creating an On-Board Memory Scene (EDIT)* on page 22).
PRGM TIME	One or more fixtures on the data link has failed to program the FlashROM in a suitable amount of time.	Attempt another software crossload (see *Crossloading Fixture Software (XLD)* on page 32). Contact High End Systems customer support if problem continues.
TMP1 LOST	The fixture cannot detect the temperature readback from the thermometer on the PCB.	Contact High End Systems customer support.
TILT ENCD	Fixture has detected a tilt error and cannot correct its position due to a: physical obstruction broken belt bad tilt encoder or encoder wheel a broken wire connecting the encoder to the logic board.	Remove the object (externally or internally) that is blocking the fixture's tilt movement and home the fixture (see *Homing the Fixture (HOME)* on page 33). Contact High End Systems customer support if problem continues.
TILT SENS	Fixture cannot find the tilt home slot due to a: broken belt faulty motor or motor driver broken wire connecting the sensor or tilt motor to the logic board bad sensor.	Contact High End Systems customer support.
UPLD	The software upload or crossload was interrupted and the fixture is held in boot mode.	Make sure the fixture is properly connected to both data and power cables, then attempt another software crossload (see *Crossloading Fixture Software (XLD)* on page 32). Contact High End Systems customer support if problem continues.

Status LEDs

Studio Command™ fixtures have five Status LEDs on the display panel. The status LEDs help analyze problems with the Studio Command fixture

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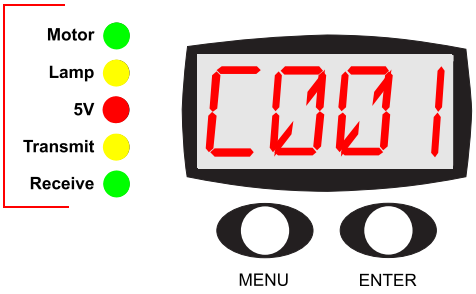
Status LEDs



LED	State	Problem Indication?	Description
Motor	solid green	No	The motor power supply is receiving adequate voltage.
	OFF	Yes	Fuse or power failure.
Lamp	solid yellow	No	Lamp power is on. Lamp is striking. The lamp power supply is receiving the proper voltage, and the lamp is on.
	OFF	Sometimes[1]	The lamp is extinguished.
5V	solid red	No	The logic board is receiving the required voltage.
	OFF	Yes	Fuse or power failure.
Transmit	solid yellow	No	Fixture is crossloading software to other fixtures on the link.
	OFF	Sometimes[2]	DMX 512 data is not being transmitted.
	flashing	No	The fixture is in preset playback mode, and is the master fixture or the fixture is a slave fixture receiving an upload.
Receive	solid or (flickering green)	No	The fixture is receiving data.
	OFF	Sometimes[2]	DMX 512 data is not being received.

1 If you shut down the lamp using a remote shutdown command, the lamp and the Lamp LED will shut off normally. However, if you have bad data cables, no data cables/controller connected to the fixture, or the controller is off, the lamp and its LED will also be off. If correcting these problems does not turn the lamp on, see the next section.

2 Neither the Transmit nor the Receive LED will be on until you have connected the fixture to a DMX 512-compatible controller using XLR data-grade cabling. If these LEDs remain OFF even though you have connected the fixture to a controller and are sending DMX 512 commands to the fixture, see the next section.

General Troubleshooting

Use the following table to find solutions to general fixture problems not indicated by alphanumeric LED display error messages or status LEDs.

Problem	Probable Cause	Solution
Fixture will not power on.	No power is connected.	Connect power to the fixture.
	Fuse is bad.	Check the power supply fuses (see *Replacing Fuses* on page 57).
	Power connectors are bad.	Contact High End Systems customer support.
Fixture functions but lamp does not strike.	The lamp is bad.	Replace the lamp (see *Replacing the Lamp* on page 60).
	The lamp is currently too hot to strike.	Provide correct power source voltage, power cord cap, and input voltage setting (see *Changing the Attachment Plug* on page 7).
	The Ignitor connection is loose.	Allow the lamp to cool, then restrike the lamp (see *Turning the Lamp On or Off (LAMP)* on page 33). Contact High End Systems customer support.
Lamp is dimmer than other fixtures.	• The lamp is bad or old. • The wrong type of lamp is installed.	Replace lamp with the specified type (see *Replacing the Lamp* on page 60).
	The lamp is not optimized.	Optimize the lamp (see *Optimizing the Lamp* on page 61).
Lamp shuts off during operation.	The lamp is bad.	Replace the lamp (see *Replacing the Lamp* on page 60).
	The fixture has exceeded the maximum temperature.	Allow the fixture 5 to 10 minutes to cool, then attempt to strike the lamp (see *Turning the Lamp On or Off (LAMP)* on page 33).
	The lamp socket is loose and causing arcing.	Contact High End Systems customer support.
Fixture will not home properly.	A sensor, driver, or motor is faulty.	Contact High End Systems customer support).
Color system is not producing the correct color.	The fixture is not properly homed.	Home the fixture (see *Control Parameter* on page 54 for controller Homing or *Homing the Fixture (HOME)* on page 33 to Home the fixture manually.) Contact High End Systems customer support if problem continues.

Problem	Probable Cause	Solution
Fixture is not responding to controller commands or is producing unexpected results.	The data cable is faulty.	Test and replace the data cables as necessary.
	No controller is attached to the link or the controller is not generating any output.	Verify that a controller is connected to the link and is generating output by sending commands to a known working device.
	The fixture has an incorrect fixture number or DMX start channel.	Verify the fixture number or DMX start channel does not overlap another fixture's DMX start channel (see *Uploading Latest Fixture Software* on page 15).
	The link was not terminated.	Terminate the link (see *Terminating the Link* on page 14).
Pan or Tilt position is off.	The pan and tilt is out of home.	Home the fixture (see *Control Parameter* on page 54 or *Homing the Fixture (HOME)* on page 33). Contact High End Systems customer service
Display is not functioning.	The LED display is set off.	Turn the LED display on (see *Changing the Display Output (DSPL)* on page 26).
	The power supply fuse is bad.	Check the power supply fuses (see *Replacing Fuses* on page 57).
	The power connectors are loose.	Re-seat the power connectors and turn the LED display on.
	The software upload was incomplete.	At fixture start-up, press the two navigational arrow buttons simultaneously. The LED will display "UPLD" and hold the fixture in boot mode. Reload the latest version of the software.
	The logic board is bad.	Contact High End Systems customer service.

Upload and Crossload Troubleshooting

The following table describe solutions to problems encountered while uploading or crossloading new software versions.

Problem	Probable Cause	Solution
Not all fixtures on the link are receiving the upload.	Fixture(s) are off	Power on the fixture(s)
	Bad cable(s)	Test and replace cable(s) as necessary
	Cable(s) disconnected	Reconnect cable(s)
	Controllers, serial data distributors, data line Optoisolators, or fixture(s) using RS-422 communication is connected *before* Studio Command fixtures on the link.	Remove or bypass any incompatible devices from the data link or move them to a link position *after* the Studio Command fixtures.
Lighting controller is not able to erase FlashROM.	The XLR cable(s) disconnected	Reconnect XLR cable(s)
	Bad cable(s)	Replace cable(s)
	The fixture's electrical circuitry is damaged	Contact High End Systems customer support.
Lighting controller does not recognize a fixture at the assigned address	Status Cue was configured with a fixture at that address, but no fixtures were found there.	• If there is not a fixture at that address, ignore this message - if there is a fixture at that address, verify the fixture number/DMX start channel. • Check connections. • Check to ensure fixture is turned on.
	Controllers, serial data distributors, data line optoisolators, or fixture(s) using RS-422 communication is connected *before* Studio Command fixtures on the link.	Remove or bypass the offending devices from the data link or move them *after* the Studio Command fixtures.
The fixture's LED displays: BOOT DIFF ERR	New software included a new boot code.	Accept and store the new boot code (see *Copying the Boot Code (BOOT)* on page 33).
Fixtures are not crossloading.	Controllers, serial data distributors, data line Optoisolators, or fixture(s) using RS-422 communication is connected *before* Studio Command fixtures on the link.	Remove or bypass any offending devices from the data link or move them *after* the Studio Command fixtures.

Appendix A:

Studio Command™ DMX Protocol

Channel	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
1	Pan	Pan, coarse adjustment	0-255	0-100	00-FF
2	Pan	Pan, fine adjustment	0-255	0-100	00-FF
3	Tilt	Tilt, coarse adjustment	0-255	0-100	00-FF
4	Tilt	Tilt, fine adjustment	0-255	0-100	00-FF
5	Color Function	***Full Speed Control***			
		Continuous	0-15	0-6	00-0F
		Cycle (Speed is set by the Cyan channel)	16-31	6-12	10-1F
		Random (Speed is set by the Cyan channel)	32-47	13-18	20-2F
		TBD	48-127	19-50	30-7F
		MSpeed Controlled			
		Continuous	128-143	50-56	80-8F
		Cycle (Speed is set by the Cyan channel)	144-159	57-62	90-9F
		Random (Speed is set by the Cyan channel)	160-175	63-69	A0-AF
		TBD	176-255	69-100	B0-FF
6	Cyan Wheel	Cyan Full Saturation	0	0	00
		Open	255	100	FF
		Cycle & Random Modes *(sets the rate for all color wheels when Color function parameter = 16-47)*			
		Slow Rate	0	0	00
		Fast Rate	255	100	FF
7	Magenta Wheel	Magenta Full Saturation	0	0	00
		Open	255	100	FF
8	Yellow Wheel	Yellow Full Saturation	0	0	00
		Open	255	100	FF
9	Zoom	Zoom Narrow	0	0	00
		Zoom Wide	255	100	FF

Channel	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
10	Shutter Function	***Normal shutter functions.*** *(No lamp or dimming functions selected in the Control channel)*			
		Close	0-23	0-9	00-17
		Periodic Strobe	24-49	9-19	18-31
		Random Strobe	50-75	20-29	32-4B
		Synchronous Random Strobe	76-101	30-40	4C-65
		Ramp Open / Snap Shut	102-127	40-50	66-7F
		Snap Open / Ramp Shut	128-153	50-60	80-99
		Ramp Open / Ramp Shut	154-179	60-70	9A-B3
		Random Ramp Open / Snap Shut	180-205	71-80	B4-CD
		Random Snap Open / Ramp Shut	206-231	81-91	CE-E7
		Open	232-255	91-100	E8-FF
		Lamp assisted strobes. *(Accessed when the Control channel range = 134-137)*			
		The shutter functions are the same as in the normal shutter function range. Periodic strobes, random random and random synchronous strobes are lamp assisted.			
		Lamp functions. *(Accessed when the Control channel range = 138-141)*			
		For lamp boost effects, the lamp is boosted above the 700 Watt level for the specified period of time. The lamp is also boosted during the lightning effects. *Before another boost or lightning effect can occur, the shutter channel must be moved to either closed or open, or the control channel must be moved outside the lamp function range.* *Boost functions to black will boost the lamp for the specified time then close the shutter. Boost functions to white will boost the lamp for the specified time, then leave the shutter open with the lamp dimmed.* *When lightning functions are selected, the dim channel scales the overall brightness of the lightning stroke. Dim at 255 will yield maximum brightness.*			
		Close	0-23	0-9	00-17
		Periodic lamp strobes	24-49	9-19	18-31
		Random random lamp strobes	50-75	20-29	32-4B
		Synchronous random lamp strobes	76-101	30-40	4C-65
		Boost lamp1.0 second, black	102-105	40-41	66-69
		Boost lamp .75 second, black	106-109	42-43	6A-6D
		Boost lamp .66 second, black	110-113	43-44	6E-71
		Boost lamp .5 second, black	114-117	45-46	72-75
		Boost lamp .33 second, black	118-121	46-47	76-79
		Boost lamp .25 second, black	122-127	48-50	7A-7F
		Boost lamp1.0 second, white	128-131	50-51	80-83
		Boost lamp .75 second, white	132-135	52-53	84-87
		Boost lamp .66 second, white	136-139	53-55	88-8B

Channel	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
10 (cont.)	Shutter (cont.)	Boost lamp .5 second, white	140-143	55-56	8C-8F
		Boost lamp .33 second, white	144-147	56-58	90-93
		Boost lamp .25 second, white	148-153	58-60	94-99
		Lightning strike 1	154-157	60-62	9A-9D
		Lightning strike 2	158-161	62-63	9E-A1
		Lightning strike 3	162-165	64-65	A2-A5
		Lightning strike 4	166-169	65-66	A6-A9
		Lightning strike 5	170-173	67-68	AA-AD
		Lightning strike 6	174-179	68-70	AE-B3
		To be determined, default black	180-231	71-91	B4-E7
		Open	232-255	91-100	E8-FF
		Lamp Dimming only. *(Accessed when the Control Channel range = 146-149)*			
		The shutter functions are the same as the normal shutter function range. Dimming is accomplished electronically, lowering the lamp power. Dimming will not go to black. Strobes are mechanical and will go to black.			
11	Dim	Close	0	0	00
		Open	255	100	FF
12	MSpeed	Disable	0-3	0-1	00-03
		Longest (252.7 sec.)	4	2	04
		Shortest (0.15 sec.)	255	100	FF
13	Macro	Macro Off	0-5	0-2	00-05
		Pan sweep, small to large angle	6-62	2-24	06-3E
		Macro Off	63-65	25-25	3F-41
		Tilt sweep, small to large angle	66-122	26-48	42-7A
		Macro Off	123-125	48-49	7B-7D
		Clockwise circle, small to large	126-160	49-63	7E-A0
		Macro Off	161-163	63-64	A1-A3
		Counterclockwise circle, small to large	164-198	64-78	A4-C6
		Reserved	199-255	78-100	C7-FF
14	Control	***The Control channel should not be crossfaded.***			
		Safe (disables all Control settings)	0-9	0-4	00-09
		Pan & Tilt MSpeed Off	10-19	4-7	0A-13
		Set Shutter channel to 0 for access to the following commands.			
		Display Off	20-28	8-11	14-1C
		Display Dim	30-38	12-15	1E-26
		Display Bright	40-48	16-19	28-30
		Home	60-68	24-27	3C-44
		Lamp On	80-88	31-35	50-58
		Lamp Off	90-98	35-38	5A-62
		Lock *(send for 5 seconds)*	110-118	43-46	6E-76
		Shutdown *(send for 5 seconds)*	120-130	47-51	78-82

Channel	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
14 (cont.)	Control (cont.)	***Lamp Functions***			
		Lamp assisted strobes (Periodic and Random strobe functions are lamp assisted. Ramp functions are not lamp assisted.)	134-137	53-54	86-89
		Lamp functions (modifies the shutter channel)	138-141	54-55	8A-8D
		Lamp/mechanical dimming (Lamp output will vary from a minimum to 700 Watts as the mechanical dimming ranges from 0-100%)	142-145	56-57	8E-91
		Lamp only dimming (Electronic dimming only from a minimum to 700 Watts.)	146-149	57-58	92-95
		To be determined	150-169	59-66	96-A9
		Audio Modulation Functions. No shutter channel requirement			
		Cyan Modulation	170-173	67-68	AA-AD
		Magenta Modulation	174-177	68-69	AE-B1
		Yellow Modulation	178-181	70-71	B2-B5
		Cyan & Magenta Modulation	182-185	71-73	B6-B9
		Cyan & Yellow modulation	186-189	73-74	BA-BD
		Magenta and Yellow Modulation	190-193	75-76	BE-C1
		Modulate all colors	194-197	76-77	C2-C5
		Dim Modulation	206-209	81-82	CE-D1
		Lamp and Dim Modulation	210-213	82-84	D2-D5
		Lamp Modulation (long sustain)	214-217	84-85	D6-D9
		Lamp Modulation (medium sustain)	218-221	85-87	DA-DD
		Lamp Modulation (short sustain)	222-225	87-88	DE-E1
		Reserved for future			
		To be determined	226-255	89-100	E2-FF

Appendix B:

MSpeed Conversion Table

The following table lists the MSpeed (motor) movement times and their corresponding DMX controller values. If you have a numeric-type controller, use the Value Decimal (dec.) column. If you have a fader-type controller, use the Value Percentage (%) column. If your controller allows you to program hex values, use the Value (hex) column.

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
0.15	255	100	FF
0.15	254	100	FE
0.17	253	99	FD
0.19	252	99	FC
0.21	251	98	FB
0.25	250	98	FA
0.29	249	98	F9
0.35	248	97	F8
0.41	247	97	F7
0.47	246	96	F6
0.55	245	96	F5
0.63	244	96	F4
0.73	243	95	F3
0.83	242	95	F2
0.94	241	95	F1
1.05	240	94	F0
1.18	239	94	EF
1.31	238	93	EE
1.45	237	93	ED
1.60	236	93	EC
1.75	235	92	EB
1.92	234	92	EA
2.09	233	91	E9
2.27	232	91	E8
2.46	231	91	E7
2.66	230	90	E6
2.86	229	90	E5
3.07	228	89	E4
3.29	227	89	E3
3.52	226	89	E2
3.76	225	88	E1
4.00	224	88	E0
4.25	223	87	DF
4.52	222	87	DE
4.78	221	87	DD
5.06	220	86	DC
5.34	219	86	DB
5.64	218	85	DA
5.94	217	85	D9
6.25	216	85	D8
6.56	215	84	D7
6.89	214	84	D6
7.22	213	84	D5
7.56	212	83	D4
7.91	211	83	D3
8.27	210	82	D2
8.63	209	82	D1
9.00	208	82	D0
9.39	207	81	CF
9.77	206	81	CE
10.17	205	80	CD
10.58	204	80	CC
10.99	203	80	CB
11.41	202	79	CA
11.84	201	79	C9
12.28	200	78	C8
12.72	199	78	C7
13.17	198	78	C6
13.63	197	77	C5
14.10	196	77	C4
14.58	195	76	C3
15.07	194	76	C2
15.56	193	76	C1
16.06	192	75	C0
16.57	191	75	BF
17.09	190	75	BE
17.61	189	74	BD
18.14	188	74	BC
18.68	187	73	BB
19.23	186	73	BA
19.79	185	73	B9
20.36	184	72	B8
20.93	183	72	B7
21.51	182	71	B6
22.10	181	71	B5
22.70	180	71	B4
23.30	179	70	B3
23.92	178	70	B2
24.54	177	69	B1
25.17	176	69	B0
25.80	175	69	AF
26.45	174	68	AE
27.10	173	68	AD
27.76	172	67	AC
28.43	171	67	AB
29.11	170	67	AA
29.80	169	66	A9
30.49	168	66	A8
31.19	167	65	A7
31.90	166	65	A6
32.62	165	65	A5
33.34	164	64	A4
34.08	163	64	A3
34.82	162	64	A2
35.57	161	63	A1
36.33	160	63	A0
37.09	159	62	9F
37.87	158	62	9E
38.65	157	62	9D
39.44	156	61	9C
39.44v	156	61	9C
40.23	155	61	9B
41.04	154	60	9A
41.85	153	60	99
42.68	152	60	98
43.50	151	59	97
44.34	150	59	96
45.19	149	58	95
46.04	148	58	94
46.90	147	58	93
47.77	146	57	92
48.65	145	57	91
49.54	144	56	90
50.43	143	56	8F
51.33	142	56	8E
52.24	141	55	8D
53.16	140	55	8C
54.09	139	55	8H
55.02	138	54	8A
55.96v	137	54	89
56.91	136	53	88
57.87	135	53	87
58.84	134	53	86
59.81	133	52	85
60.79	132	52	84
61.78	131	51	83

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
62.78	130	51	82
63.79	129	51	81
64.80	128	50	80
65.82	127	50	7F
66.85	126	49	7E
67.89	125	49	7D
68.94	124	49	7C
69.99	123	48	7B
71.05	122	48	7A
72.13	121	47	79
73.20	120	47	78
74.29	119	47	77
75.38	118	46	76
76.49	117	46	75
77.60	116	45	74
78.71	115	45	73
79.84	114	45	72
80.98	113	44	71
82.12	112	44	70
83.27	111	44	6F
84.43	110	43	6E
85.59	109	43	6D
86.77	108	42	6C
87.95	107	42	6B
89.14	106	42	6A
90.34	105	41	69
91.55	104	41	68
92.76	103	40	67
93.98	102	40	66
95.21	101	40	65
96.45	100	39	64
97.70	99	39	63
98.95	98	38	62
100.22	97	38	61
101.49	96	38	60
102.77	95	37	5F
104.05	94	37	5E
105.35	93	36	5D
106.65	92	36	5C
107.96	91	36	5B
109.28	90	35	5A
110.61	89	35	59
111.94	88	35	58

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
113.28	87	34	57
114.63	86	34	56
115.99	85	33	55
117.36	84	33	54
118.73	83	33	53
120.12	82	32	52
121.5v	81	32	51
122.91	80	31	50
124.31	79	31	4F
125.73	78	31	4E
127.15	77	30	4D
128.58	76	30	4C
130.02	75	29	4B
134.39	72	28	48
135.86	71	28	47
137.34	70	27	46
138.82	69	27	45
140.32	68	27	44
141.82	67	26	43
143.33	66	26	42
144.85	65	25	41
146.38	64	25	40
147.92	63	25	3F
149.46	62	24	3E
151.01	61	24	3D
152.57	60	24	3C
154.14	59	23	3B
155.71	58	23	3A
157.30	57	22	39
158.89	56	22	38
160.49	55	22	37
162.09	54	21	36
163.71	53	21	35
165.33	52	20	34
166.96	51	20	33
168.60	50	20	32
170.25	49	19	31
171.91	48	19	30
173.57	47	18	2F
175.24	46	18	2E
176.92	45	18	2D
178.61	44	17	2C
180.30	43	17	2B

Time (sec.)	Value (dec.)	Value (%)	Value (hex)
182.01	42	16	2A
183.72	41	16	29
185.44	40	16	28
187.17	39	15	27
188.90	38	15	26
190.65	37	15	25
192.40	36	14	24
194.16	35	14	23
195.92	34	13	22
197.70	33	13	21
199.48	32	13	20
201.28	31	12	1F
203.08	30	12	1E
204.88	29	11	1D
206.70	28	11	1C
208.52	27	11	1B
210.36	26	10	1A
212.19	25	10	19
214.04	24	9	18
215.90	23	9	17
217.76	22	9	16
219.63	21	8	15
221.51	20	8	14
223.40	19	7	13
225.30	18	7	12
227.20	17	7	11
229.11	16	6	10
231.03	15	6	0F
232.96	14	5	0E
234.90	13	5	0D
236.84	12	5	0C
238.79	11	4	0B
240.75	10	4	0A
242.72	9	4	09
244.70	8	3	08
246.68	7	3	07
248.68	6	2	06
250.68	5	2	05
246.68	7	3	07
248.68	6	2	06
250.68	5	2	05
252.68	4	2	04

Appendix C:

Important Safety Information

Warning: For Continued Protection Against Fire

1. This equipment is designed for use with a Phillips 700 watt, GY 22 base, metal halide lamp only. Use of any other type lamp may be hazardous and may void the warranty.
2. Do not mount on a flammable surface.
3. Maintain minimum distance of 1.0 meter (3.28 feet) from combustible materials.
4. Replace fuses only with the specified type and rating.
5. Observe minimum distance to lighted objects of 2.0 meter (6.56 feet).
6. This equipment for connection to branch circuit having a maximum overload protection of 20 A.

Warning: For Continued Protection Against Electric Shock

1. If this equipment was received without a line cord plug, attach the appropriate line cord plug according to the following code:
   - brown–live
   - blue–neutral
   - green/yellow–earth
2. As the colours of the cores in the mains lead of this equipment may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
   - the core which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol ⏚, or coloured green or green and yellow.
   - the core which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
   - The core which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
3. Class I equipment. This equipment must be earthed.
4. Equipment suitable for dry locations only. Do not expose this equipment to rain or moisture.
5. Disconnect power before re-lamping or servicing.
6. Refer servicing to qualified personnel; no user serviceable parts inside.

Warning: For Continued Protection Against Exposure To Excessive Ultraviolet (UV) Radiation

1. Change shields, and lenses if they have become visibly damaged to such an extent that their effectiveness is impaired, for example by cracks or deep scratches.
2. Never look directly at the lamp while lamp is on.

Warning: For Continued Protection Against Injury To Persons

1. Use secondary safety cable when mounting this fixture.
2. Caution: Hot lamp may be an explosion hazard. Do not open for 5 minutes after switching off. Wear eye and hand protection when re-lamping.
3. Equipment surfaces may reach temperatures up to 160° C (320° F). Allow 5 minutes for cooling before handling.
4. Change the lamp if it becomes damaged or thermally deformed.

Appendice C: Importantes Informations Sur La Sécurité

Mise En Garde: Pour Une Protection Permanente Contre Les Incendies

1. Cet appareil est conçu uniquement pour une lampe métallique à halogène Philips, de 700 watts, à base GY 22. Son utilisation avec tout autre type de lampe peut être dangereuse et annuler la garantie.
2. Ne pas monter les lampes sur une surface inflammable.
3. Maintenir à une distance minimum de 1.0 mètre de matières inflammables.
4. Ne remplacer les fusibles qu'avec des modèles et valeurs assignées recommandés.
5. Respecter une distance minimum de 2.0 mètre par rapport aux objets éclairés.
6. Cet appareil de connection au circuit comporte une protection contre les surcharges de 20 A.

Mise En Garde: Pour Une Protection Permanente Contre Les Chocs Électriques

1. Si cet équipement est livré sans prise de cable, veuillez connecter la prise de cable correcte selon le code suivant:
   - marron - phase
   - bleu - neutre
   - vert/jaune - terre
2. Débrancher le courant avant de changer les lampes ou d'effectuer des réparations.
3. Cet équipement doit être uniquement utilisé dans des endroits secs. Ne pas l'exposer à la pluie ou l'humidité.
4. À l'intérieur de l'équipement il n'y a pas de pièces remplaçables par l' utilisateur. Confiez l'entretien à un personnel qualifié.
5. Equipement de Classe I. Cet équipement doit être mis à la terre.

Mise En Garde: Pour Une Protection Permanente Contre Des Expositions Excessives Aux Rayons Ultra Violets (UV)

1. Changer les blindages ou les écrans s'ils sont visiblement endommagés au point que leur efficacité aient été altérée, par exemple par des fissures ou de profondes égratignures.
2. Ne jamais regarder directement la lampe quand celle ci est allumée.

Mise En Garde: Pour Une Protection Permanente Contre Les Blessures Corporelles

1. Lors de l'assemblage, utiliser un câble de sécurité secondaire.
2. AVERTISSEMENT: Les lampes chaudes comportent un risque d'explosion. Après l'avoir éteinte, attendre 5 minutes avant de la dégager. Lors du remplacement de la lampe, une protection des yeux et des mains est requise.
3. Les surfaces de l'appareil peuvent atteindre des températures de 160 C. Laisser refroidir pendant 5 minutes avant la manipulation.
4. Changer la lampe si elle est endommagée ou thermiquement déformée.

Anhang C: Wichtige Hinweise Für Ihre Sicherheit

Warnung: Zum Schutz Vor Brandgefahr

1. Dieses Gerät ist nur für den Gebrauch mit einer 700-Watt, Philips, Metall-Halogen-Lampe mit GY 22-Sockel konzipiert. Der Gebrauch irgend eines anderen Lampentyps könnte Sie gefährden und Ihre Garantie außer Kraft setzen.
2. Das Gerät nie auf einer feuergefährlichen Fläche montieren.
3. Stets einen Mindestabstand von 1 Meter zu brennbaren Materialien einhalten.
4. Zum Ersatz nur Sicherungen verwenden, die dem vorgeschriebenen Typ und Nennwert entsprechen.
5. Einen Mindestabstand von 2 Meter zu den angestrahlten Objekten einhalten.
6. Dieses Gerät darf nur an eine Zweigleitung mit einem Überlastungsschutz von höchstens 20 A angeschlossen werden.

Warnung: Zum Schutz Gegen Gefährliche Körperströme

1. Wenn dieses Gerät ohne einen Netzkabelstecker erhalten wurde, ist der entsprechende Netzkabelstecker entsprechend dem folgenden Code anzubringen:
   - Braun - Unter Spannung stehend
   - Blau - Neutral
   - Grün/Gelb - Erde
2. Vor dem Austauschen von Lampen oder vor Wartungsarbeiten stets den Netzstecker ziehen.
3. Diese Geräte sind nur zum Einbau in trockenen Lagen bestimmt und müssen vor Regen und Feuchtigkeit geschützt werden.
4. Servicearbeiten sollten nur von Fachpersonal ausgeführt werden. Das Gerät enthält keine wartungsbedürftigen Teile.
5. Dieses Gerät gehört zur Klasse I. Dieses Gerät muß geerdet werden.

Warnung: Zum Schutz Gegen Übermässige Ultraviolett (UV)-Bestrahlung

1. Die Schutzabdeckungen, Linsen und der UV-Schutz müssen ausgewechselt werden, wenn sie sichtlich dermaßen beschädigt sind, daß sie ihre Wirksamkeit einbüßen, z.B. infolge von Rissen oder tiefen Kratzern.
2. Nie direkt in die eingeschaltete Lampe schauen.

Warnung: Zum Schutz Vor Verletzungen

1. Verwenden Sie bei der Installation des Beleuchtungskörpers ein zusätzliches Sicherheitskabel.
2. VORSICHT: Bei einer heiße Lampe besteht Explosionsgefahr. Nach dem Abschalten der Netzspannung sollten Sie etwa 5 Minuten warten, bevor Sie das Lampengehäuse öffnen. Schützen Sie beim Auswechseln der Lampen Ihre Hände und tragen Sie eine Schutzbrille.
3. Die Oberflächen des Gerätes können Temperaturen bis zu 160 C erreichen. Vor dem Anfassen stets 5 Minuten lang abkühlen lassen.
4. Falls die Lampe beschädigt oder durch Wärmeeinwirkung verformt ist, muß sie ausgewechselt werden.

Apéndice C: Información Importante De Seguridad

Advertencia: Para Protección Continua Contra Incendios

1. Este equipo está diseñado para utilizarse únicamente con la lámpara de haluro metálico Philips, de 700 vatios y base GY 22. El uso de cualquier otro tipo de lámpara puedá resultar peligroso, y puedá anular la garantía.
2. No monte el equipo sobre una superficie inflamable.
3. Mantenga una distancia mínima de materiales combustibles de 1,0 metro.
4. Cambie los fusibles únicamente por otros que sean del tipo y la clasificación especificadas.
5. Guarda una distancia mínima a objetos iluminados de 2,0 metro.
6. Este equipo debe conectarse a un circuito que tenga una protección máxima contra las sobrecargas de 20 A.

Advertencia: Para La Protección Continua Contra Electrocuciones

1. Si se recibió este equipo sin el enchufe de alimentacion, monte usted el enchufe correcto según el clave siguente:
   - moreno - vivo
   - azul - neutral
   - verde/amarillo - tierra
2. Desconecte el suministro de energía antes de recambiar lámparas o prestar servicio de reparación.
3. Questa apparecchiatura e' da usarsi in ambienti secchi. Non e' da essere esposta ne alla pioggia ne all' umidita'.
4. Derive el servicio de reparación de este equipo al personal calificado. El interior no contiene repuestos que puedan ser reparados por el usuario.
5. Equipo de Clase I. Este equipo debe conectarse a la tierra.

Advertencia: Para Protección Continua Contra La Exposición A Radiación Ultravioleta (UV) Excesiva

1. Cambie el blindaje, los lentes si nota una avería visible, a tal grado que su eficacia se vea comprometida. Por ejemplo, en el caso de grietas o rayaduras profundas.
2. Jamás mire directamente a la lámpara en tanto ésta esté encendida.

Advertencia: Para Protección Continua Contra Lesiones Corporales

1. Al montare questa apparechiatura, usare un secondo cavo di sicurezza.
2. Precaución: Una lámpara caliente puede constituir un peligro de explosión. No la abra por 5 minutos luego de haberla apagado. Lleve puestos, un protector ocular, y guantes al recambiar lámparas.
3. Las superficies del equipo pueden alcanzar temperaturas máximas de 160 grados centígrados. Deje que se enfríen por 5 minutos antes de tocarlas.
4. Cambie la lámpara si ésta se avería o deforma por acción térmica.

Appendice C: Importanti Informazioni Di Sicurezza

Avvertenza: Per Prevenire Incendi

1. Questa apparecchiatura è stata progettata per l'uso esclusivo con lampada a sali metallici Philips da 700 watt, base GY 22. L'uso di qualsiasi altro tipo di lampada può essere pericoloso e può annullare la garanzia.
2. Da non montare sopra una superficie infiammabile.
3. Mantenere l' apparecchio a un minimo di 1.0 metri (3.28 piedi) di distanza dai materiali combustibili.
4. Rimpiazare i fusibili usando soltanto quelli del tipo e della taratura adatta.
5. Mantenere una distanza minima di 2.0 metri (6.56 piedi) dagli oggetti accesi.
6. Questa apparecchiatura e' da collegarsi ad un circuito con una protezzione da sovraccarico massima di 20 amperes.

Avvertenza: Per Prevenire Le Scosse Elettriche

1. Se questa apparecchiatura è stata consegnata senza una spina del cavo di alimentazione, collegare la spina appropriata del cavo di alimentazione in base ai seguenti codici:
   - marrone - sotto tensione
   - blu - neutro
   - verde/giallo - terra
2. Disinnestare la corrente prima di cambiare la lampadina o prima di eseguire qualsiasi riparazione.
3. Este equipo se adecua a lugares secos solamente. no lo exponga a la lluvia o humedad.
4. Per qualsiasi riparazione rivolgersi al personale specializzato. L' utente non deve riparare nessuna parte dentro l' unita'.
5. Aparecchio di Classe I. Questa apparecchiatura deve essere messa a terra.

Avvertenza: Per Proteggersi Contro Le Radiazioni Dei Raggi Ultravioletti

Non usare questa apparecchiatura se il sistema di chiusura della lampadina non e' completo o se gli scudetti, le lenti, si sono visibilmente danneggiati di maniera tale che la loro efficacia sia stata ridotta --- ad esempio, se vi sono visibili spaccature o graffi profondi. Mai guardare direttamente verso la lampadina quando sia accesa.

Avvertenza: Per Non Ferire Ad Altre Persone

1. Use cable secundario de seguridad al montar este aparato.
2. Avvertenza: La lampadina calda potrebbe esplodere. Spegnerla per 5 minuti prima di aprirla. Usare protezzioni per le mani e per gli occhi prima di cambiare la lampadina.
3. Le superfici della apparecchiatura possono arrivare a temperature di 160 gradi centrigradi (194 gradi f). Aspettare 5 minuti prima di maneggiare.
4. Cambiare la lampadina se si danneggia o se si e' deformata dovuto alle alte temperature.

Vigtig Sikkerhedsinformation

Advarsel: Beskyttelse mod elektrisk chock.

VIGTIGT!

LEDEREN MED GUL/GROEN ISOLATION MAA KUN TILSLUTTES KLEMME MAERKET

ELLER .

Appendix D:

Menu Map

The Studio Command fixture's onboard menu system allows you to:

- Assign a DMX start channel
- Access fixture options such as, homing the fixture, viewing fixture status, crossloading software, and performing self tests
- Preset (PRST) programming options that allow you to create, store, and play scenes from the fixture's on-board memory.

For a more detailed description, see individual menu options listed in *Chapter 3: The Menu System* on page 19.

Level 1	Level 2	Level 3	Level 4	Level 5	Description
ADDR	Cxxx				change the existing DMX start channel
PRST	PLAY	OFF			set preset playback off
		ON			set preset playback on
		SCN			display which scene is currently playing
	EDIT	SN01–SN16	SHUT	CLSD	close the shutter
				P01–P26	select shutter strobe at periodic intervals from slow (P 01) to fast (P268)
				NN01–NN26	select shutter strobe at random intervals from slow (NN01) to fast (NN26)
				NK01–NK26	select shutter strobe at random intervals from slow (NK01) to fast (NK26), in synchronization with the random strobing of all other Studio Command fixtures on the link
				RS01–RS26	select shutter ramp open slow (RS01) to fast (RS26), snap shut
				SR01–SR26	select shutter snap open, ramp shut slow (SR01) to fast (SR26
				RR01–RR26	select shutter ramp open, ramp shut slow (RR01) to fast (RR26)
				NR01–NR26	select the frequency to randomly ramp open slow (NR01) to fast (NR26), snap shut
				NS01–NS26	select the frequency to snap open, randomly ramp shut slow (NS01) to fast (NS26)
				OPEN	open the shutter
			DIM	D001–D255	select a dim value from dark (D001) to bright (D255)
			PAN	-49.9–+49.9	select a pan value from -49.9% to +49.9% of the pan range
			TILT	-49.9–+49.9	select a tilt value from -49.9% to +49.9% of the tilt range

Level 1	Level 2	Level 3	Level 4	Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01 - SN16 (cont.)	COLC	Full Speed Mode	
				CON	continuous—select exact positioning at any point on the color wheel
				CYCL	cycles through colors with cyan channel setting cycle speed.
				RND	random—perform random color chase of 12 factory-selected colors using the three color wheels (speed set by cyan channel)
				MSpeed Mode	
				MCON	continuous—select exact positioning at any point on the color wheel
				MCYC	cycles through colors with cyan channel setting cycle speed.
				MRND	random—perform random color chase of 12 factory-selected colors using the three color wheels (speed set by cyan channel)
			CYAN	D000 - D255	select an exact position on the cyan color wheel from 0 (D000) to full saturation (D255) when COLC = CON
				L000 - L255	sets speed of CYCL mode from stop (L000) to full speed (L255)
				N000 - N255	sets speed of RND mode from stop (N000) to full speed (N255)
			MAGN	D000 - D255	select an exact position on magenta color wheel from 0 (D000) to full saturation (D255)
				CYCL	No function in CYCL or RND COLC modes.
				RND	
			YELW	D000 - D255	select an exact position on yellow color wheel from 0 (D000) to full saturation (D255)
				CYCL	No function in CYCL or RND COLC modes.
				RND	
			ZOOM	Z000–Z255	select a zoom value for a beam angle from 18° (Z000) to 33° (Z255)
			MSPD	252.7–0.15	select a motor movement time in decimal seconds, from slow (252.7) to fast (0.15)
				0.15–252.7	select a motor movement time in decimal seconds, from fast (0.15) to slow (252.7)
			MACR	MCOF	set all macro options off
				P00-P56	pan sweep macro from small to large
				TO	macros off
				T00–T56	tilt sweep from small to large
				CO	macros off
				C00–CC34	clockwise circle macro

Level 1	Level 2	Level 3	Level 4	Level 5	Description
PRST (cont.)	EDIT (cont.)	SN01-SN16 (cont.)	MACR	CCO	macros off
				CC00–CC34	counterclockwise circle macro
				MCOF	set all macro options off
			XFAD	X 0.1 - X 9.9	select the DIM and FCUS construct's crossfade time in increments of 0.1
				X 10 - X166	select the DIM and FCUS construct's crossfade time in increments of 1
			DLAY	D 0.1 - D 9.9	select the scene delay time in increments of 0.1
				D 10 - D166	select the scene delay time in increments of 1
			TIME	SEC	select seconds as the units of time used for the XFAD and DLAY constructs
				MIN	select minutes as the units of time used for the XFAD and DLAY constructs
			TIME (cont.)	HOUR	select hours as the units of time used for the XFAD and DLAY constructs
			ZERO	OK?	erase any programming of the current scene by voiding all construct values / mark the end of the loop
	COPY	FROM		FA01 - FA16	select a user A scene to copy from (source scene)
				FA01 - FA16	select a user B scene to copy from (source scene)
		TO		TA01 - TA16	select a user A scene to copy to (destination scene)
				TB01 - TB16	select a user B scene to copy to (destination scene)
	CAPT			SN01 - SN16	select a scene to capture a pre-programmed scene to (from your DMX controller)
	DFLT	OK?			enable the factory-programmed preset scene sequence (self-demo) / erases any preset scenes previously programmed
SET	SEND				send all presets in current user
	FACT			ON	set factory defaults on
				OFF	set factory defaults off
	SWAP			ON	set pan/tilt swap on
				OFF	set pan/tilt swap off
	T/IN			ON	set tilt invert on
				OFF	set tilt invert off
	P/IN			ON	set pan invert on
				OFF	set pan invert off
	DSPL			ON	set the LED display on
				OFF	set the LED display off
				DIM	dim the LED display

Level 1	Level 2	Level 3	Level 4	Level 5	Description
SET (cont.)	D/IN			ON	select inverted LED display orientation
				OFF	select normal LED display orientation
	LMPL			ON	enable lamp hour warning message
				OFF	disable lamp hour warning message
	FAST			ON	enable fast pan and tilt movement
				OFF	enable normal pan and tilt movement
	DLOS			LONG	shutter will remain open until shutdown if DMX data is lost
				SHRT	shutter will close one second after DMX data is lost
	ADIO	ALED		ON	uses central dot of alphanumeric display as audio indicator
				OFF	audio indicator off
		GAIN		G001–G010	set a value from G001 (more emphasis on quiet sounds) to G010 (less emphasis on quiet sounds). Factory default is G006
MODE	USER	A			select user A settings
		B			select user B settings
		COPY	PRST	A →B	copy user A presets to user B
				B →A	copy user B presets to user A
			SETT	A →B	copy user A settings to user B
				B →A	copy user B settings to user A
			ALL	A →B	copy user A presets and settings to user B
				B →A	copy user B presets and settings to user A
	XLD				crossload fixture software to other Studio Command fixtures on the link
TEST	HOME				home the fixture
	LAMP			ON	strike the lamp
				OFF	extinguish the lamp
	BOOT				copy the boot sector
	SELF			ALL	self test all constructs
				PAN	self test pan movement
				TILT	self test tilt movement
				CYAN	self test cyan color wheel movement
				MAGN	self test magenta color wheel movement
				YELW	self test yellow color wheel movement
				ZOOM	self test zoom movement
				SHUT	self test shutter strobe movement
				DIM	self test dim flag movement
	S/UP				place the fixture in setup mode for mechanical homing
	DISP				self test the LED display
	ENCD			ON	restore pan and tilt encoder operation
				OFF	disable pan and tilt encoder operation
	CODE				Factory use only

Level 1	Level 2	Level 3	Level 4	Level 5	Description
INFO	SENS	TILT			view whether the tilt sensor is obstructed (“ON”) or is not obstructed (“OFF”)
		PAN			view whether the pan sensor is obstructed (“ON”) or is not obstructed (“OFF”)
		TPOS			view the tilt position encoder status
		PPOS			view the pan position encoder status
	UNUM				Customer Service use only
	DMX	DMX Values displayed when standard protocol is selected			
		FIXT	BRKS		view the number of DMX breaks
			FE		view the number of DMX framing errors
			OV		view the number of DMX overruns
			STRT		view the DMX start code value
			PANH		view the DMX high resolution pan value
			TLTH		view the DMX high resolution tilt value
			TLTL		view the DMX low resolution tilt value
			COLC		view the DMX color control channel value
			CYAN		view the DMX cyan color wheel position value
			MAGN		view the DMX magenta color wheel position value
			YELW		view the DMX yellow color wheel position value
			ZOOM		view the DMX zoom lens position value
			SHUT		view the DMX shutter strobe value
			DIM		view the DMX shutter dim flag value
			MSPD		view the DMX MSpeed time value
			MACR		view the DMX macro value
			CNTL		view the DMX control channel value
		DATA		C001 - C512	view the DMX data for the selected DMX channel
	TEMP	PCB			view the current temperature at the logic board (C)
		HEAD			view the current internal head temperature (C)
	F/RS				reset fixture hours to zero *(press and hold the <Enter> button for five seconds to change the value)*
	F/HR				view current number of fixture hours
	L/RS				reset lamp hours to zero *(press and hold the <Enter> button for five seconds to change the value)*
	L/ST				view the current number of lamp strikes
	L/HR				view the current number of lamp hours
	VER				view the fixture’s software version